ENGAGEMENT SKILLS TRAINER: THE COMMANDER'S
PERSPECTIVE

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The use of simulations is in an evolving capability in the U.S. Army. The Engagement Skills Trainer (EST) is a simulated rifle marksmanship trainer. Past research shows the EST is a cost-effective trainer. Research does not show how commanders use the EST in their training program. The study interviewed twenty previous company commanders. The study determined that commanders moderately used the EST in their unit training plans. Moderate is defined as greater than 50 percent used two or more of the EST training capabilities: individual, crew, and judgment training. In this study, commanders only scheduled the EST as part of primary marksmanship instruction. However, ten of the nineteen commanders used an additional training capability of the EST. The study concluded with recommendations to improve EST use. The author recommends making EST a mandatory part of marksmanship training. The author also recommends using EST as a record of fire for a sustainment training event. This record of fire event can only occur once per year and after a live fire qualification.

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The opinions and conclusions expressed herein are those of the student author and do not necessarily represent the views of the U.S. Army Command and General Staff College or any other governmental agency. (References to this study should include the foregoing statement.)

ABSTRACT

ENGAGEMENT SKILLS TRAINER: THE COMMANDER'S PERSPECTIVE, by
Major Ryan Debeltz, 91 pages.

The use of simulations is in an evolving capability in the U.S. Army. The Engagement
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ACRONYMS

ARNG	Army National Guard
AS3	Assistant Staff Officer to the S3ATP Army Technical Publications
BRM	Basic Riffle Marksmanship
CBRN	Chemical Biological Radiological and Nuclear
CGSOC	Command and General Staff Officers Course
DMG	Digital Master Gunner
EST	Engagement Skills Trainer
FORSCOM	U.S. Army Forces Command
FOUO	For Official Use Only
HPA	Human Protections Administration
NCO	Non-Commissioned Officer
PMI	Preliminary Marksmanship Instruction
TRADOC	U.S. Army Training and Doctrine Command
TSAID	Training Support Analysis Integration Directorate
WTU	Warrior Transition Unit

ILLUSTRATIONS

CHAPTER 1

INTRODUCTION

> The potential for simulations in training cannot be overemphasized.
> Moreover, the use of simulations is grounded in our history.[1]
> —General Robert Cone, *Military Review*

Overview

You just lost ten million dollars, one-fifth of your annual budget. How will you

prepare for war or complete your mission? What organizational changes have to be made,

or what resources will be reduced? These questions are not hard to imagine. Dollars drive

the army. Few soldiers ever see the actual dollar amount associated with the events. With

wartime budgets cut significantly, commanders must find creative ways to train soldiers

with less money.

Limited resources force commanders to find new ways to train soldiers. Ammo

crews may practice loading and reloading in a motor pool. Soldiers might practice

individual movement techniques in the company area or grassy fields rather than driving

out to a local training area. Some commanders may decide to use heavy equipment

transporters (HET) to move larger tracked vehicles to training areas in order to reduce

fuel costs and maintenance needs to the fleet. Some may practice firing weapons on a

simulated range. Alternative training methods provide means to train soldiers in a

constrained environment.

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[1] Robert Cone, "Building the New Culture of Training," *Military Review* (January-February 2013): 14.

Simulations are events that synthetically prepare armies for military actions. They could be digital systems or board games. Simulations date back to ancient history. In the digital era, simulations experienced an exponential rate of development, growing rapidly in use, size, and expense. The Army also provides these tools to train soldiers. Some of the tools are easy to acquire and use, but some tools the Army uses are very costly, and require the Army to maintain system trainers and facilities. How does the Army know if the tools are effective or efficient? Who is trained to use the systems?

Simulators are at every echelon up to the corps and army level. They are used at the individual and squad level with EST, medical simulation training center (MSTC), or dismounted soldier training system (DSTS). The higher-echelon simulators allow large units like divisions and corps to simulate training for commanders and staffs who organize and plan combat operations. Commanders do not need to have the Abrams tanks, Bradley fighting vehicles, or Paladin artillery pieces moving around on the battlefield. The troop movement is simulated, saving massive funds in operating costs to the units. Furthermore, the Army training areas are not suited for division or corps-replicated battle in field environment.

Simulations are designed to help organizations train a dangerous activity in a safe environment or reduce the price to conduct an activity. The Engagement Skills Trainer is a technical virtual trainer that soldiers use to practice marksmanship capabilities. The EST is a cost-effective training aid, which saves the Army money.[2] However, could the

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[2] Training Support Analysis and Integration Directorate, "Engagement Skills Trainer (EST) 2000 Post-Fielding Training Effectiveness Analysis" (Fort Eustice, VA: Department of the Army, January 2014), 6.

Engagement Skills Trainer be better utilized? Could the EST better help the commander maintain a ready force?

The Engagement Skills Trainer is a simulated weapons training systems. The basic system is a five-lane, simulated weapons firing system. See figure 1.
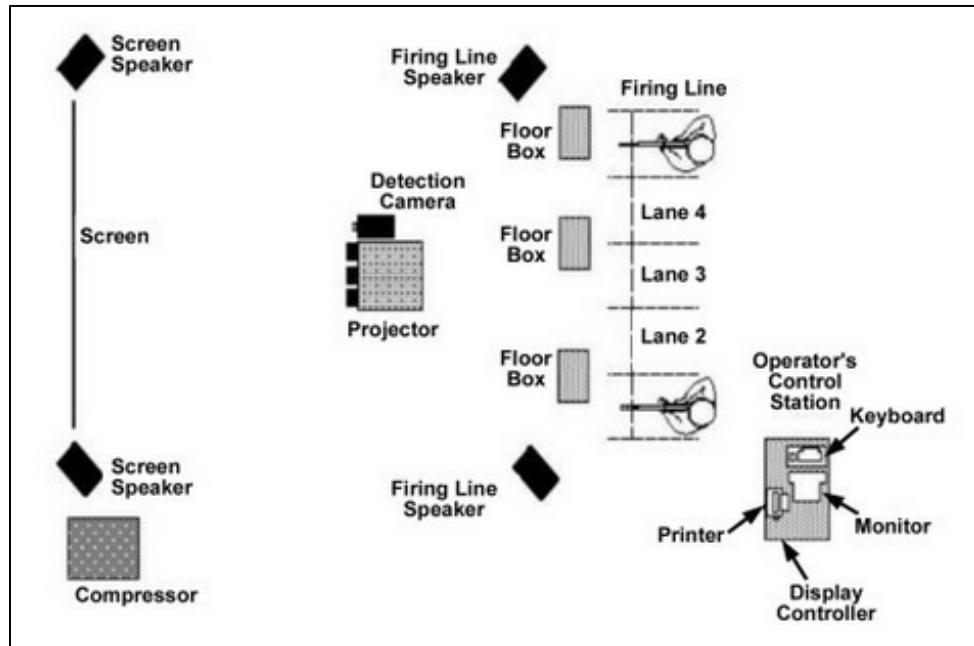
Figure 1.   EST Overview.

Source: U.S. Army, Field Manual (FM) 3-22.9, *Rifle Marksmanship M-16/M-4 Series Weapons* (Washington DC: Department of the Army, 2008), A-1.

The EST has the capability to train soldiers in three different capacities: individual, collective (crew-served), and judgement (scenario-based) training. The simulator provides a variety of weapons systems to choose: M9, M-4/M-16, M249,

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M240B, M2, MK-19, M203, Shotgun, and AT-4.[3] Soldiers can conduct training on individual training platforms. These systems enable the soldier to prepare for a live fire event, receive detailed training to improve their capability, or conduct a familiarization fire to gain comfort using the system. Soldiers can choose from a variety of individual weapons systems, such as M-9, M-4, or M-249. The soldier also has the capability to simulate the shoulder fired AT-4 anti-tank weapon.

Soldiers also conduct crew-served weapons training in the EST. the crew weapons consist of M-240B, M-2, and the MK-19. Soldiers have the opportunity to practice weapons qualifications in the simulator. Unique to the crew-served weapons is the commander can use the EST system as a certification platform.[4] The Army authorized crews to qualify in the simulator for these crew-served weapons. The significant impact to a commander maintaining unit readiness. When a unit has personnel turn-over, commanders can cycle crews through the EST to certify and help maintain unit readiness ratings.

Finally, soldiers can conduct a scenario driven event enabling the leaders to develop judgement skills in the shoot/don't-shoot training event. The scenario training provides a great opportunity to help develop junior leaders. Younger NCOs or soldiers are placed in an urban environment and must use communications skills to de-escalate tensions. Trainers can choose to raise, maintain, or lower tensions in the scenario base on the young leader's actions. The platoon and company leadership can assess how the

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[3] U.S. Army, Training Support Analysis and Integration Directorate, 6.

[4] John Bess, interviewed by Ryan Debeltz, Fort Riley, KS, March 14, 2017.

young leader responds to escalating tension or crisis. Through training and mentoring company leadership can use the scenario training events to help develop personnel in, or about to enter leadership roles.

The EST has different capabilities to train soldiers. When commanders use the full capabilities of the system, the EST can have a significant impact on soldiers and the unit. However, the EST is only beneficial if a commander chooses to use the system.

Purpose

The purpose of this study is to improve EST use to better assist the commander in training soldiers. Additional benefits will identify how commanders use the EST to train soldiers. If there is a noticeable gap in capability and use, this research will provide recommendations to close the gap. This research attempts to understand EST use and provide recommendations to commanders.

Research Question

This study evaluates how commanders utilize the Engagement Skills Training as part of their unit training plans. The commander is the leader and must motivate the unit to achieve results. This study answers the following primary research question: Can Engagement Skills Trainer use be improved? To answer the primary research question, four secondary questions must be answered. First, how often was the EST used? Second, why did the commander use the EST? Third, will the EST improve unit capabilities? Finally, why was the EST not used more? Conducting a qualitative analysis of simulated rifle marksmanship training at the company level will answer the research questions. The

research conducted personal interviews to understand EST use. The research asked the following questions during the interviews.

1. Did your unit use the EST?

    a. If your answer is "No," please, provide a description as to why and do not answer any of the following questions. Thank you for your time and consideration.

    b. If your answer is "YES," please, answer the following questions.

2. How often and why was EST training provided?

3. What was the focus of EST training sessions, individual, crew, or judgment training?

4. Did your unit conduct night and CBRN familiarization fires in the EST? If not, why?

5. How often was live training provided?

6. What were the first time go rates for live fires? Was the EST useful to prepare soldiers?

7. Was ammunition left over and what was done with the excess ammunition?

8. Did you want to spend more unit training time on the EST? If yes, what prevented spending more time?

9. Where is EST superior to live training?

10. Where is EST deficient to live training?

11. Did you find the EST effective to train soldiers?

12. How would you like to improve the EST system capability?

Data Collection Plan

All data was collected during a twenty to thirty-minute interview. The interviews were conducted at the Army's Command and General Staff College at Fort Leavenworth, Kansas. The interviews occurred over a one-month period. The interviewees were all post command Field Artillery Captains (Promotable) or Majors. The subjects recalled information regarding EST and live-fire training during their command. Their command time occurred roughly one to four years ago. Subjects were not asked to gather any historical documents from their command time. All the information collected was from interviewee's memory. Further details of the data collection are covered in the methodology chapter.

Assumptions

The first assumption of this research is that leaders are able to remember detailed facts regarding training events while in command. Many interviewees may not remember statistics, details, or dates with great certainty. This research assumes the interviewees can recall historical training information.

A second assumption is that the leader can remember accurately. Remembering and remembering accurately are two different things. Sometimes peoples' minds may fill in memory gaps. This tendency has the potential to affect how people answer the questions. Former commanders may include information from a canceled range exercise, a previous exercise, or believe the unit conducted more ranges than actually occurred. However, this research assumes interviewees accurately remember training events from their command.

The third assumption is that commanders remember training events, regardless of command climate and higher headquarters training priorities. Different commanders have different priorities. One commander may have priorities on 350-1 training to stay out of the hot seat, while other commanders may focus on training and preparing for war. The brigade and battalion command focus may impact what the battery level commander remembers. If the battalion commanders always emphasized SHARP (Sexual Harassment and Response Program) training, the battery commander may vividly recall those events but not the range exercises, live fire exercises, or Family Readiness Group activities. Human psychology plays a pivotal role in memory. Emotional memories are linked closely to the ability to remember, forget, or replace fact with fiction. Memories fade with time. Nonetheless, this research assumes interviewees can recall information regardless of higher headquarters command emphasis.

The aforementioned assumptions have the potential to skew the research data. The fact that commanders are not referencing historical training records indicates they have to rely on memory. With skewed data, there is potential impact to the hypothesis. The data could be of benefit or consequence to the research. It is important to understand these may be inaccuracies due to the stated assumptions.

<div align="center">Limitations and Delimitations</div>

The research is presented with limitations encountered during the study. There are three primary limitations: time allocated to complete research, and that information collected by the Army is For Official Use Only (FOUO) and limited distribution. First, time allocated to research was limited. The project was completed during a nine-month period. The time constraint was exacerbated by the human subject research approval

process, which required two months and thus constrained time allocated to collect more interviews.

The second limitation is restricted information. The Army has collected data for EST by each installation. The numbers represent total times the systems are used. This information is marked FOUO and is limited in distribution. Restricted information limited the ability to request and compare data. Additionally, installations track EST training by number and hours used. Training centers do not track what system is used in the EST—individual, collective, or judgment.

The limitations identified in this study were mitigated as much as possible to conduct clear research and provide accurate and relevant data. First, the researcher used local research from the institutional educational library. The research was completed according to a timeline set during the beginning of the project to aid completion. Next, the research used all available date to understand the problem and develop research question. Any FOUO information was not included in the research unless clear consent was given by the author or agency. Additionally, interviews with subject matter experts at the Combined Arms Center and Fort Riley Mission Training Center provided crucial information to the research.

There are also some delimitations imposed on this research. The delimitations are imposed due to time constraints to conduct and defend the research. Therefore, the research is limited to twenty interviewed subjects. The interviews of twenty artillery officers provided enough raw data to conduct meaningful research. An additional delimitation is that all interviews are from Field Artillery officers currently attending Command and General Staff Officers Course (CGSOC). No officers from any other

branch of service were included in the research. It is understandable that infantry and armor units may potentially use the EST more. These delimitations allowed time to conduct research in time to complete this study.

Significance of Research

This research shows how commanders use the EST. Much of the current research shows the Engagement Skills Trainer is a cost-effective system that prepares soldiers for rifle marksmanship qualification.[5] However, the EST can do much more than simply provide M4 rifle marksmanship qualification practice. Soldiers use the EST to practice on the M9, M240B, M249, M2, MK-19, and AT-4.[6] The newest EST II, currently in fielding, also offers a shotgun simulation. The systems additionally provided the ability to train leaders on judgment and decision making in the shoot-don't-shoot scenario.

How effectively is the Army taking advantage of these opportunities? Does the Army use the system as well as intended? Could commanders use the EST better? These questions are less known than cost-benefit analysis. How is the EST used by company commanders is as important as cost savings? Otherwise, a cost-effective device not utilized is still just a waste of money.

Conclusion

This thesis is a qualitative study to answer the question, "Can EST use be improved?" To answer the research question, the study must also ask four supporting questions. First, how often was the EST used? Second, why did the commander use the

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[5] U.S. Army, Training Support Analysis and Integration Directorate, 7.

[6] John Bess, interviewed by Ryan Debeltz, Fort Riley, KS, March 14, 2017.

EST? Third, will the EST improve unit capabilities? Finally, why was the EST not used

more? The goal of the research is to improve the commander's implementation of the

EST into their unit training plan.

CHAPTER 2

LITERATURE REVIEW

Overview

The Engagement Skills Trainer is a technical virtual weapons trainer that soldiers use to improve marksmanship capabilities, conduct familiarization fires with crew served weapons, and engages in scenario driven training events. The Army provides the EST for conducting training in a safe and cost-effective manner. Although the EST is a cost-effective system, could the Engagement Skills Trainer be better utilized? Could the EST better help the commander maintain a ready force?

The literature review presented in chapter 2 is organized and presented to understand past research. First, doctrine is presented to provide the Army regulation that prescribes soldier training. Second, the development and procurement of the EST is presented to explain how the Army has integrated the EST, as well as made changes and updates to the system. Third, training applications are presented demonstrate how personnel have used the EST. Fourth, performance analyses are presented of the EST's efficacy in comparison to live fire. Finally, the EST's cost-benefit justifies the value of the system and its continued use in the Army.

Doctrine

The Army uses doctrine to guide behavior and operations in peacetime and war. Commanders use Army doctrine as their guide to establish training plans and conduct operations. The following doctrine, deals with marksmanship training: FM 3-22.9, *Rifle Marksmanship M-16/M-4 Series Weapons*; AR 350-1, *Army Training and Leader*

Development; and DA PAM 350-38, *Standards in Weapons Training*. These documents

provide the foundation and guidance for marksmanship training.

Marksmanship is a critical individual skill, which requires training. Weapons

qualification is the hallmark assessment of a commander's weapons training program.[7]

Unit training follows a progression starting with primary marksmanship instruction (PMI)

and culminating in a live fire qualification events.[8] Training progresses from zeroing the

weapon, to practice a qualification, and ends with live-fire qualification. The EST is

encouraged for PMI but is not required as part of the training progression. Figure 2 shows

how the Army envisions the EST as part of the commander's training plan. The EST is

highly encouraged for commanders to use as part of their training program, though it is

not mandated.[9]

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[7] U.S. Army, AR 350-1 *Army Training and Leader Development* (Washington DC: Department of the Army, 2014), 188.

[8] U.S. Army, Field Manual (FM) 3-22.9, *Rifle Marksmanship M-16/M-4 Series Weapons* (Washington DC: Department of the Army, 2008), 1-4.

[9] Ibid.
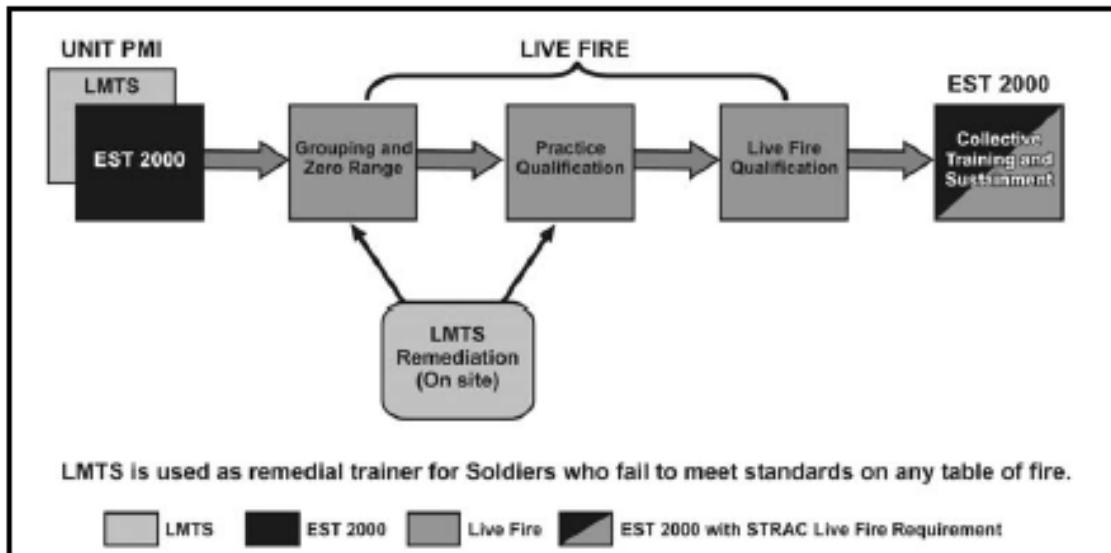
Figure 2.   Marksmanship Training Progression.

Source: U.S. Army, Field Manual (FM) 3-22.9. *Rifle Marksmanship M-16/M-4 Series Weapons* (Washington DC: Department of the Army, 2008), 1-4.

This illustration clearly identifies the intent to use the EST during PMI across the entire training progression. The EST is not only to be used before a live range, but also as part of the sustainment training program.

While the EST is authorized for PMI, it cannot substitute for live fire qualifications.[10] Once qualified, however, commanders may use the system to continue training or conduct advanced rifle marksmanship (ARM). Soldiers can receive detailed feedback to show breathing patterns and trigger pull problems.[11] Some TDA units in the

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[10] U.S. Army, FM 3-22.9, A-2.

[11] John Bess, interviewed by Ryan Debeltz, Fort Riley, KS, March 14, 2017.

Army do not have assigned weapons on their MTOE, but they can use the EST instead.[12] Even though it does not count as a live qualification, soldiers can maintain proficiency using the EST.

The EST reduces a unit's annual allocated ammunition. In DA PAM 350-38 *Standards in Weapons Training*, an artillery unit's M-4 ammunition allocation is reduced from 356 rounds per weapons to 196 rounds if the EST is available.[13] These numbers represent one weapon system for iron sights. The allocated ammunition changes in units with additional optics. Units that have close combat optics, ammunition allocation changes from 454 rounds without an EST available to 294 rounds when ESTs are available. Additionally, units with ESTs available are required to conduct CBRN and unassisted night qualification in the EST.[14] The Army has placed Training Aids, Devices, Simulators, and Simulations (TADSS) in the force with the expectation units will use it in their training plans, and consequently reduced the live ammunition allocated for training and live fire qualification.

<div align="center">Development and Procurement</div>

The Army has EST systems across installations worldwide. There are three essential capabilities to the EST: individual training, collective training, and shoot/don't-shoot judgment training. The available systems vary from the individual weapon to crew

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[12] U.S. Army, AR 350-1, 189.

[13] U.S. Army, DA PAM 350-38, *Standards in Weapons Training* (Washington DC: Department of the Army, 2016), 27.

[14] Ibid., 26.

machine gun platforms. The EST has different components such as screens and computers, software versions, and weapons systems. To meet the demands in *AR 5-11, Management of Army Modeling and Simulation*, the Army is fielding new software, but not new weapons systems.[15] Of course, not replacing the weapons systems saves money on initial contract and fielding costs. However, as time passes, weapons systems wear out. Eventually, those systems will be replaced. An analysis of the EST expenses will be discussed in greater detail later in this chapter.

Though the Army may save money by not replacing the weapons on the new EST systems, this has severe drawbacks. A post-field training effectiveness analysis reports 40 percent of soldiers experienced technical difficulties while shooting the M-4 in the EST.[16] This rate was higher than other weapons systems. It is reasonable to conclude that the M-4 wears out more quickly than other systems because the M-4 being the primary individual weapon for the soldier, gets the most use during training. While a phased integration of new systems can save the government money, there must be a balance between wear and serviceability when planning the program implementation.

<u>Training</u>

The hardest part of using the EST is qualifying the trainer within the unit to lead unit training. This is a multi-day training event for leaders.[17] Once the leader is trained,

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[15] Christopher Finnigan, interview by author, Fort Leavenworth, KS, 12 October 2016.

[16] TRADOC Analysis Center, "PFTEA," 21.

[17] John Bess, interviewed by Ryan Debeltz, Fort Riley, KS, 14 March 2017.

soldier training is simpler. The benefits to EST training are many: easy access to the

system, multiple systems trained in a one-day session, easy facility clean up, no weapons

cleaning, and no arms room check out or inventories conducted. These provide the

commander with more time to develop proficiency in the unit.

In addition to times savings, the EST can be better than a live range. The EST

provides detailed and immediate feedback to soldiers, tracks the progress of the shooter,

and helps soldiers move from novice to expert.[18] Feedback provided by the EST enables

soldiers to analyze shot performance against the four firing fundamentals. Detailed

information about performance lets the soldiers make fine adjustments in technique. The

maintainers can reset the program and re-run the scenario. Soldiers get the immediate

feedback, and can determine if the new technique improves performance.

Similar findings are reported in a United States Army Aeromedical Research

Laboratory (USAARL) study. Herber Jones highlighted that the aim and trace feature in

EST 2000 provided shooters with detailed pictures of the muzzle movement while

firing.[19] With this feature, soldiers can see exactly where their weapon is pointed before,

during, and after each shot. The aim and trace helps to identify issues with the firing

fundamentals. If soldiers are afforded the opportunity to retrain, they can see if

performance improved. If the performance was not improved, soldiers continue to make

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[18] Anthony Ciavarelli, William Platte, and Johnny Powers, "Teaching and Assessing Complex Skills in Simulation with Application to Rifle Marksmanship" (paper presented at the Interservice/Industry Training, Simulation and Education Conference (I/ITSEC 2009), Orlando FL, 30 November-3 December 2009), 1.

[19] Heber Jones, Melody King, and Steven Gaydos, *A Novel Application of the Point and Aim Trace Feature of the Engagement Skills Trainer 2000* (Fort Rucker, AL: United States Army Aeromedical Research Laboratory, 2011), 2.

adjustments and try again. This is repeated until soldiers reach the desired end state: marksman, sharpshooter, or expert.

Although the simulator provides the training capability, the EST is just a simulator, not a live range with lead rounds going down range. The psychological impacts of simulated weapons training have the potential to alter the shooter's ability to transition to a live range. Research conducted by Gratch and Marsella attempted to highlight how emotions in simulated training may affect soldier performance. The researchers noted negative training, over confidence, and ineffective training beliefs may have negative effects on soldier's performance.[20]

Negative training is a degraded capability following simulated training.[21] Some soldiers notice the difference in live and simulated training. For these soldiers, they focus their attention on the subtle differences. Soldiers then lose sight of the system capabilities. These soldier's performance degrades over time because they are focused on what is wrong with the simulator. Over confidence is gained when a soldier performs better in the simulation. Some soldiers find simulators easier to perform well. This provides a false positive ability in some soldiers that is not matched on live ranges. Though this is nice while in the simulator, soldiers are frustrated from poor performance on a live range. Finally, ineffective training is based on preconceived beliefs. Soldiers

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[20] Johnathan Gratch and Stacy Marcella, "Fight the Way You Train: The Role and Limits of Emotions in Training for Combat," *The Brown Journal of World Affairs* 10, no. 1 (Summer/Fall 2003): 3-4.

[21] Ibid.

find simulators a waste of time because it does not replicate reality. Therefore, soldiers do not perform well and validate their beliefs.

The use of the EST may have psychological impacts on soldiers live fire performance. Even though the EST can be used for training, it has not been recommended for M-16/M-4 qualification. Therefore, no changes have been made to rifle marksmanship qualification requirements as it pertains the EST outlined in FM 3-22.9.[22]

<div align="center">Performance</div>

Company commanders have a great tool to train soldiers. However, the simulator is only effective if the simulator aids soldiers in their performance on the range or in a live fire training event. This improved performance can be quantified by live fire qualification scores. Studies by TRADOC and Hagman show that EST performance predicts live fire results. Some studies look at range qualification only, while others observe collective task or crew served weapons training. Since the EST's introduction to the Army, studies from the mid1990s to recent years have proven the simulators effectiveness.

One of the earliest EST studies, conducted in 1994 by the TRADOC Analysis Center, evaluated the EST's impact on M-16 qualification scores, and two collective tasks: point ambush and squad sector defense. TRADOC's analysis of M-16 qualification scores used a control group that received traditional training prior to qualification, and an

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[22] U.S. Army, FM 3-22.9, A-2.

experimental group received the EST and traditional live training.[23] Despite problems

with the EST, including inaccurate target size on the display, digital sound replications,

and recoil inaccuracies, TRADOC found no statistical differences in the EST and the

traditional live fires scores. Any variation in individual scores was not statistically

different, and there were no differences among numbers of expert, sharpshooter, and

marksman qualifiers.[24]

A unique aspect of the study was soldier and instructor feedback regarding

characteristics and capabilities of the EST. The consensus among the soldiers was the

EST provided added value to training. However, anecdotes noted soldier's belief the EST

is not realistic regarding recoil, target appearance, and target contrast.[25] The authors note

that soldiers in the EST generally do worse at weapons safety and orientation.[26]

Indicators from research show that EST results predict live fire results. The greatest

implication is that the EST trains soldiers, but does not replace live fires.

Joseph Hagman studied the EST in the late 1990s to examine EST and live fire

score correlations. The study evaluated 102 Army National Guard (ARNG) soldiers:

seventy-nine infantry soldiers, and twenty-three soldiers from various support Military

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[23] TRADOC Analysis Center, "Engagement Skills Trainer (EST) Training
Effectiveness Analysis (TEA), iv.

[24] Ibid., 20.

[25] Ibid., 21.

[26] Ibid., iv.

Occupation Skills (MOS).[27] The intent of the study was to see if the EST is a simulator capable of training and evaluating Army National Guard Units (ARNG). The ARNG is limited to about thirty-nine days of training throughout the year. Limited annual training days force commanders to maximize training time and resources. Hagman looked to see if the EST was able to aid the ARNG in rifle marksmanship.

The research split the 102 soldiers evenly into groups of fifty-one. Hagman tested the two groups on live fire and EST ranges. He identified a predictive correlation between the two methods of qualification.[28] The ARNG wanted to qualify soldiers on the EST rather than the live fire range. Hagman asserted that although the EST is good at predicting live fire scores, further testing is required, and that the EST should not replace live fire qualification. Rather, the EST may best be used to identify soldiers weak in marksmanship skills and improve their weaknesses.[29]

A 2002 post fielding analysis study showed no performance difference on the M-16 and M-240B, indicating that soldiers achieved very similar results while firing on the simulated and live-fire ranges. [30] Agagin, the EST accurately predicts the live fire score. Even though the scores are similar, no changes occurred to M16 qualifications. Soldiers are still required to qualify with live fire ammunition on a range. Although the post

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[27] Joseph Hagman, "Using the Engagement Skills Trainer to Predict Rifle Marksmanship Performance," *Military Psychology* 10, no. 4 (1998): 216.

[28] Ibid., 220.

[29] Ibid., 222.

[30] TRADOC Analysis Center, "Engagement Skills Trainer (EST) 2000 Post-Fielding Training Effectiveness Analysis (PFTEA)," vi.

fielding reports showed similar EST and live range scores with the M16 and M240B, this does indicate an ability to replace live fire ranges with virtual training simulators.

<div align="center">Cost Benefit</div>

The EST comes with a price tag in both development and sustainment costs. The Training Support Analysis Integration Directorate (TSAID) conducted a study in 2014 to determine the cost benefit of the Engagement Skills Trainer 2000. The TSAID study determined the annual cost of the EST is roughly $450 thousand per system.[31] TSAID does not define the details "a system" in the study. The researcher assumes that TSAID refers to a system as a stand-alone unit with its own hardware and software package, with weapon systems in each facility. Though the EST can operate in an independent station of five lanes, a system with ten lanes in one facility with one computer and two screens is counted as one system. Installation such as Fort Riley have an EST located in two separate facilities and therefore operate two systems.[32] The cost ranges from about $400 thousand to $515 thousand annually, per system.[33] The annual costs associated include, but are not limited to system maintenance, facilities, and work hours.

The overall five-year procurement and sustainment cost of the EST is estimated at $494.3 million.[34] Although the cost of the system is high at nearly one-half billion dollars, the system provides a cost-benefit and saves the Army money. The TSAID

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[31] U.S. Army, Training Support Analysis and Integration Directorate, 6.

[32] John Bess, interviewed by Ryan Debeltz, Fort Riley, KS, March 14, 2017.

[33] U.S. Army, Training Support Analysis and Integration Directorate, 6

[34] Ibid., 6.

considered that the EST saves the Army nearly $81.1 million per year on just M-16 and

M-4 ammunition, assuming units comply with STRAC requirements.[35]

Though the Army has sufficient research about capabilities and cost-benefit, there

is none that shows how commanders implement the EST into their training programs. Do

commanders find value and efficacy in the EST? The closest indication of commander's

perceived value is in the TRADOC Analysis Center study indicating that sixty-eight (72

percent) of ninety-four shooters found the EST to be similar or same as live fire

training.[36] Nothing noted a value from the commander's point of view. The difficulty is

getting commanders to find enough value in the system to conduct training in the EST. If

the commander does not know about the system, is unfamiliar with the system, or is

intimidated by the system, the engagement skills trainer will not be fully utilized.

<u>Summary</u>

The literature review presented provides sufficient data of current training

capabilities and cost-benefits. There is a clear understanding that the Army's intent is for

commanders to use the EST based on information provide in FM 3-22.9, AR 350-1, and

DA PAM 350-38. Millions of dollars are saved each year on M-4 ammunition alone.

Additionally, yearly ammunition allocations are reduced for units on instillations with

ESTs. This is a driving force to commit commanders to use the EST. However, the Army

does not require EST use by regulation; rather it is implied that commanders use the EST

because the allocated ammunition anticipates they conduct night and CBRN fires in the

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[35] U.S. Army, Training Support Analysis and Integration Directorate, 7.

[36] TRADOC Analysis Center, "PFTEA," 19.

simulator. Research is not available to determine how a commander uses the EST. Does the commander use the individual weapons capability only? Does the commander also use the crew served weapons and judgment scenario training in unit training plans? The current research shows the Army tracks the number of hours used by installation, but not how the commander uses the EST to train soldiers.

CHAPTER 3

RESEARCH METHODOLOGY

Purpose

The purpose of this study is to improve EST use to better assist the commander to train soldiers. Additional benefits of the research identify how commanders use the EST to train soldiers. Furthermore, a noticeable gap in capability and use provides an opportunity to make recommendations to close the gap. This research attempts to understand EST use and provide recommendations to commanders to improve training programs.

This study answers the following primary research question: Can Engagement Skills Trainer use be improved? To answer the primary research question, four secondary questions must be answered. First, how often was the EST used? Second, why did the commander use the EST? Third, will the EST improve unit capabilities? Finally, why was the EST not used more? Conducting a qualitative analysis of simulated rifle marksmanship training from commanders at the company level will answer the primary research questions.

This chapter describes the research process. First, the setting is described with detailed information on where the research was conducted and why it was conducted in the chosen setting. Second, the sample population is explained, as well as the reasons the researcher chose this sample population. Third, the approval process for conducting human subject research is described. Fourth, the chapter restates the interview questions. Also explained is the information expected and how that information contributes to the research. Lastly, the data collection process is explained. The research describes how the

data was collected through the research process. This chapter also identifies the timeline for data collection.

Setting and Participants

The study took place at the U.S Army's Command and General Staff Officers Course at Fort Leavenworth, Kansas. The participants for this study were CGSOC students, selected because their proximity facilitated research within the time constraints of the school year. Selecting fellow CGSOC student enabled direct contact with the students to conduct personal interviews with each participant. Additionally, fellow students were chosen because of their qualification. The consensus is that students attending CGSOC are considered in the top half of their year group. This is not a hard fact, but a generalized statement. With the current reduction in forces, the selection to major and attendance at CGSOC as officers is the first measurement against peers. To be a resident student at CGSOC, an officer must have performed well and completed key development time as a Captain. These are the top considerations when identifying subjects to interview for research because the subjects have proven they performed well as a Captain and while in command.

In the 2016-2017 academic school year, fifty-six active duty Army artillery officers were invited to participated in a one on one interview. The interviewer conducted twenty interviews for the study. The length of each interview was twenty to thirty minutes. During the interview, the researcher asked four administrative questions followed by twelve research questions. Follow-up questions were conducted for clarification or greater understanding, but the base questions remained unchanged. A detailed look at the questions along with data gathered will follow.

The interviews were conducted at the Command and General Staff College's Lewis and Clark Center. This provided space and a comfortable setting for conducting the interviews. The interviewer typed all responses to the questions and follow-up questions during the interview. Follow-up questions were not added to the interview; rather the responses were included with the appropriate question. The interviews concluded with an opportunity for each interviewee to ask questions or make any additional comments about the EST.

Research Approval

Request for research with human subjects was processed through the CGSOC Human Protections Administrator (HPA) and the Collaborative Academic Institutional Review Board (IRB). The initial consent request was sent to the HPA on 17 November 2016. Approval for research was authorized on 16 December 2016. The research consent form was sent to the HPA on 10 January 2017. See consent form in Appendix A. Authorization was granted to use the consent form and conduct the research on 18 January 2017.

Research Question

Can Engagement Skills Trainer use be improved in Field Artillery unit training programs?

The following questions are asked to each interviewee. Also provided is a brief description with the intended data collected and how the question is analyzed.

Administrative Information

When and how long were you in command (year / #months)? This helps determine how long the person was in command and how many times his soldiers would qualify with their weapon.

Type of unit commanded? (Artillery, Combat arms, or other) This helps determine if the interviewee commanded in a Modified Table of Organization and Equipment (MTOE) unit or in a Table of Distribution Allowance (TDA) unit. MTOE units maintain weapons and have to qualify. TDA units may not have weapons and do not qualify every six months.

Did you spend any time as an AS3 or S3? How many months? This helps to understand if the interviewee managed or tracked battery level training.

Were you deployed while in command? This identifies time the commander would not have access to an EST and therefore not able to use the system.

Subsequent Research Questions

1. *Did your unit use the EST?* Identifies if the commander used the EST. If not the interviewee describes why, limited availability, not comfortable, no training, or did not know about the system.

   a. If your answer is "No," please, provide a description as to why and do not answer any of the following questions. Thank you for your time and consideration.

   b. If your answer is "YES," please, answer the following questions.

2. *How often and why was EST training provided?* This identifies how many times the commander used the system and size of element that use the EST.

The significance of the question identifies if the EST was used for improving soldier's skills, prepare for M16 qualification, certify crews on crew systems or judgment and decision making training.

3. *What was the focus of EST training sessions, individual, crew, or judgement training?* The significance of the question identifies if the commanders focus was on crew certification or individual training and practice.

4. *Did your unit conduct night and CBRN familiarization fires in the EST? If not, why?* The significance of the question identifies if commanders are compliant with regulations and conducted training required or authorized in the EST since units have reduced ammo allocation on instillations with ESTs.

5. *How often was live training provided?* This identifies the number of live fires sessions and is compared to the number of times the EST is used by the units.

6. *What were the first time go rates for live fires? Was the EST useful to prepare soldiers?* The significance of the question identifies how well soldiers performed, and if EST is used, does the commander see a perceived benefit.

7. *Was there ammunition left over and what was done with excess ammunition?* This identifies how efficient soldiers shot and the amount of ammunition remaining that may have been used for advanced training. The number of firing iterations captures data. The significance of the question identifies if there was opportunity to use ammunition for advanced marksmanship training or train weak soldiers.

8. *Did you want to spend more unit training time on the EST? If yes, what prevented you from spending more time?* The significance of the question

identifies the if the EST facility was limited, if the training was not available, if the commander did not have qualified trainers, or if there were too many time conflicts to permit EST training.

9. *Where is EST superior to live training?* The significance of the question identifies how the commander believes the EST is best utilized compared to live training.

10. *Where is EST deficient to live training?* The significance of the question identifies how the interviewee believes the EST is best utilized compared to the EST.

11. D*id you find the EST effective to train soldiers?* The significance of the question identifies if the commander believes the system replicates and is suitable to replace live training or qualification.

12. *How would you like to improve the EST system capability?* The significance of the question identifies any potential capabilities gaps or training deficiencies.

A qualitative analysis of responses was conducted upon completion of all twenty surveys. The analysis of the data attempted to identify how commanders perceived the EST impacted unit training. Was the EST used, what were the perceived benefits, and what limitations were encountered? What does the commander feel? How well did the EST enable the commander to achieve unit training objectives? What did the commander like or dislike about the system?

Data Collection

Fifty-five emails were sent out to artillery officers at CGSOC. Each email was individually sent and addressed to the student. Twenty-six students replied indicating a willingness to participate in the interviews. A total of twenty interviews were completed between 20 January 2017 to 15 February 2017. A compilation of answers of all twenty interviewees, by question can be found in Appendix B. The sequence of responses has been randomized so no person can link responses to interviewees to ensure the anonymity of the participants. The data will be maintained for a minimum of five years in compliance with the CGSOC school policy.

Summary

This study identifies how commanders used the EST to train soldiers. The data is analyzed in chapter 4, and chapter 5 provide recommendations to better use the EST in unit training programs and bridge the gap between the commander's training intent and implementation of the EST.

CHAPTER 4

ANALYSIS

Introduction

The purpose of this study is to improve the commander's EST use in their unit training programs. Additionally, the research identifies how commanders use the EST to train soldiers. Furthermore, a noticeable gap in capability and use provides an opportunity to make recommendations to improve training capabilities.

To answer the primary research question, four secondary questions must be answered. First, how often was the EST used? Second, why did the commander use the EST? Third, will the EST improve unit capabilities? Finally, why was the EST not used more? Conducting a qualitative analysis of simulated rifle marksmanship training from commanders at the company level will answer these research questions.

This chapter is organized to present the data collected during the research, answer secondary research questions, and culminate with supporting evidence to answer the primary research question. First, the purpose is restated with the primary and secondary questions. Second, the administrative data informs the reader who was interviewed, how they were included or excluded from the data, and why. Third, secondary questions 1 through 4 are answered. Fifth, the research answers the primary research question. Finally, the conclusion is presented with a summary or data. The conclusion ties chapter 4 to chapter 5.

The purpose of this study is to improve the EST use to better assist the commander to train soldiers. To improve the EST use, the research must determine how, how often, and why commanders use the EST. For this study, how well a commander

implemented the EST is labeled as either marginal, moderate, or maximum. A commander's maximum EST use integrated all three training capabilities: individual, collective (crew served training), and judgement based scenario training. Moderate is defined as a commander who used two of EST's three training capabilities. Marginal is defined as a commander who used one or none EST training capability.

Additionally, the commanders were rated as a group to determine how well they implemented the EST into training. For this study, the labels marginal, moderate, and maximum, were used to describe an overall evaluation of EST use. Maximum is defined as greater than 50 percent of commanders who used all three of the ESTs training capabilities. Moderate is defined as greater than 50 percent used at least two of the ESTs training capabilities. Finally, marginal is defined as at least 50 percent used only one of the ESTs training capabilities.

This chapter analyzes the results of twenty interviews completed over a two-month period. The administrative data is presented first. The administrative data provided background information about individuals' command settings and duration. It also included information regarding any deployment time. The administrative information gave the necessary information to narrow the collective group to individuals with non-deployed command time in artillery or maneuver units, and eliminated commander's deployment time or TRADOC commands. Then this chapter provides analysis of the twelve questions completed in the interview. All information presented in this chapter is a representation of the raw data, which can be viewed in Appendix B.

Population Data

The research initially collected administrative data to develop background information of each artillery commander interviewed. The intent was to understand how much time each officer had in command, the type of unit they commanded, if they spent times as an S3 or AS3 planning operations, or if they were deployed while in command. This data helps understand opportunities to use the EST or trends discovered by unit type or length of command time. The data also identified factors to help eliminate commanders or part of a commander's time while deployed or in TRADOC commands. Of the twenty interviewees, three commanders self-identified they did not implement the EST into unit training programs. For various reasons, such as time constraints and personal dislike of the EST, these individuals elected not to use the EST.

Additionally, some interviewees completed command time in a TRADOC unit. For the purpose of this study, their TRADOC command time is not included. These individuals had scripted training plans that mandated the use of the EST; it was not a matter of choice. One individual had all nineteen months of his command time in a TRADOC unit. None of his command time was assessed in the study. However, his responses to personal preference questions depicted in questions nine through twelve were included.

Finally, one individual had two command periods; one in a FORSCOM unit, and one in a TRADOC unit. The fifteen-month command time in a TRADOC unit was excluded from the results in this research. However, his two-year FORSCOM command time was included in the results. Another individual had a second command time in a Warrior Transition Unit (WTU). He did not have normal training programs like

TRADOC units. WTU units focus on providing necessary care to soldiers, not preparing for war. For the purpose of this study, his command time in the WTU unit was excluded from the results of the study. Later in this chapter, the researcher highlights the WTU commander's use of the EST with wounded soldiers, but the numbers are not included in the results.

Twenty interviews were completed. Three individuals chose to not use the EST. One additional individual had all of his command time in a TRADOC unit. Therefore, sixteen of the twenty interviews are presented. The administrative information was gathered in four questions to each interviewee.

The first administrative question captured the length of time in command. The average time while in command for the nineteen respondents was twenty-one months. The shortest command time was fourteen months, while the longest command time was thirty-four months. One commander had thirty-nine months of command time, but fifteen months were in a TRADOC command, and therefore not counted in the averages. Table 1 shows the distribution of command time of the nineteen interviewees. A longer length of command provides greater opportunity to use Army training systems. At a minimum, soldiers are required to conduct qualification two times per year in order maintain rifle proficiency. In theory, this should yield at least two opportunities to use the EST, if commanders take advantage of the system at their disposal. The average length of command time is roughly twenty-one months; therefore, commanders should use the EST for at least three training events, assuming the commanders use the EST.
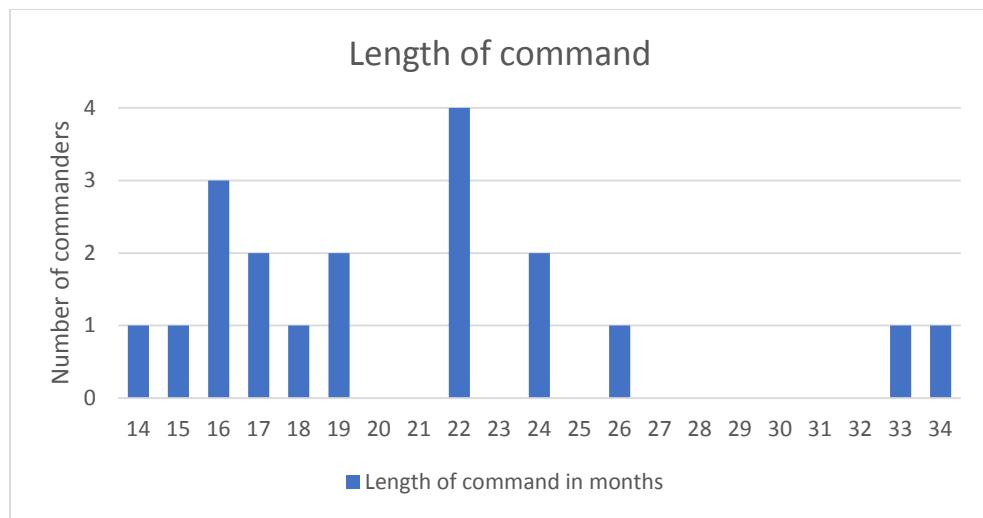
Figure 3.   Length of Command

Source: Created by author.

The time range soldiers commanded occurred from 2007 through 2016. The soldier who commanded during 2007 had a second command that occurred from 2011-2013. Though this was a TRADOC command and not counted in the overall results, the second command falls in line with the norms of the respondents. Of the commanders, thirteen of nineteen (68 percent) had command time which either started or finished in the years 2012 through 2016. This provides context to the operation tempo. This timeframe was past the height of military operations in Iraq and Afghanistan. U.S. troops were removed from Iraq, while troop numbers were significantly reduced in Afghanistan. This meant more stabilization for commanders and more opportunity to conduct weapons training.

The second administrative question looked at the kind of unit the soldiers commanded to confirm that artillery officers commanded an artillery unit. Artillery units, like armor units, have gunnery tables focused, not on an individual weapons system, but

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on a specific artillery cannon or rocket system, thus not making the M-4 a focus of unit training. Sixteen of the nineteen (84 percent) of the soldiers commanded field artillery units. The type of artillery units includes all variations of artillery platforms (105mm, 155mm, Multiple Launch Rocket System [MLRS], or target acquisition battery). In addition to artillery units, three soldiers commanded exclusively outside of artillery units. Their commands were in a headquarters and headquarters troop (HHT) of a cavalry squadron, combat aviation brigade, and infantry weapons company. Additionally, three of the persons interviewed commanded in a WTU or a TRADOC unit. The three artillery officers not in command of an artillery unit was included in the results of the study, because he had command of a FORSCOM unit and conducted his own training plans.

Next, commanders were asked about time spent as a S3 or an assistant S3. Time spent as an S3 or AS3 may give commanders insight to training opportunities and unit training plans. If they are part of resourcing or reporting systems for a battalion, these commanders may be exposed to EST training opportunities prior to command. Of the sixteen commanders, only nine soldiers had experience as an AS3 or S3. The time spent as an AS3 or S3 ranged from five to twenty-four months. The average time for those with AS3 experience was 13.7 months. This information had little to do with the results, as soldiers identified they were not part of the training or resourcing for EST range time.

Finally, commanders were assessed on time spent deployed while in command. Eight of the nineteen commanders (42 percent) were deployed while in command. The range of deployed command was three to twelve months. The average time spent deployed of those commanders was nine months; three of them deployed for twelve months. The time spent deployed is a limiting factor on EST use. The commanders may

have received priority for training and ranges, but once deployed, did not have access to an EST. There is one exception to the deployed units. One commander deployed to Kuwait, which had an EST located on the installation. In this instance, the commander was able to use and take advantage of the time and resources available to him during the deployment. Otherwise, deployments likely hinder a commander's ability to use the EST to improve the unit's readiness or capabilities. Therefore, for the purpose of this study, the results excluded deployment time.

EST use could be improved. The data showed commanders made moderate use of the EST during command. Ten of nineteen commanders used two or more of the three training capabilities in the EST: individual, crew, and judgment training. Of the ten, only one commander used all three capabilities.

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Secondary Question #1
How Often Was the EST Used?

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Secondary question 1 is answered through detailed analysis of survey questions 1 and 2. Survey question 1 examined how many commanders use the EST. Of the nineteen commanders interviewed, sixteen (84 percent) used the EST to train soldiers. Three soldiers chose not to use the EST. Of the three commanders that chose to not use the EST, two commanders were slightly limited by deployments. These soldiers were deployed for eight months while in command. With the limited remaining time while in command, these two commanders opted to focus on live or other individual training, not use the EST. What was not determined was, given more time or resources, would they have chosen to use the EST?

The remaining commander chose not to use the EST based on strong personal preferences. He vehemently opposed the use of digital training to practice rifle marksmanship. He stated it builds confidence in a gaming environment, which can be detrimental when translated to the live range. He believes the simulated ranges are treated more like a game rather that an actual live fire event, resulting in the simulation instilling a false sense of confidence in ability as well as decreased focus on safety. He acknowledged some benefits to the EST, like repetitions and cost-benefits to simulated training, but refused to incorporate the EST into his training plans.

Survey question 2 looked at how often and why commanders use the EST. The commanders' responses provided a wide variety of use and reasons. The number of times the sixteen officers used the EST ranged from once to a staggering twenty-two times. This was an outlier for this sample, as that officer more than doubled the next highest rate of use at nine instances. One TRADOC unit commander, not included in the results, used the EST fifty-six times during a nineteen-month period. This training was scripted and not chosen by the commander. Therefore, none of the TRADOC command time data was included.

A closer look showed the nineteen commanders used the EST sixty-eight times. A commander who adheres to Army practices of qualifying once every six months would be expected to use the EST as PMI roughly three to four times in twenty-one months. The average EST use was 3.57 times. This data showed commanders used the EST almost four times during the average command time of twenty-one months, an expected amount for the average command time. If the one commander who used the EST twenty-two times is removed, the data drops below the norms. With the removal of the outlier, the

average drops to 2.55. Less than three EST ranges per commander over twenty-one months is below expectations if commanders use the EST as PMI. Table 2 reflects the number of EST ranges scheduled by commanders.
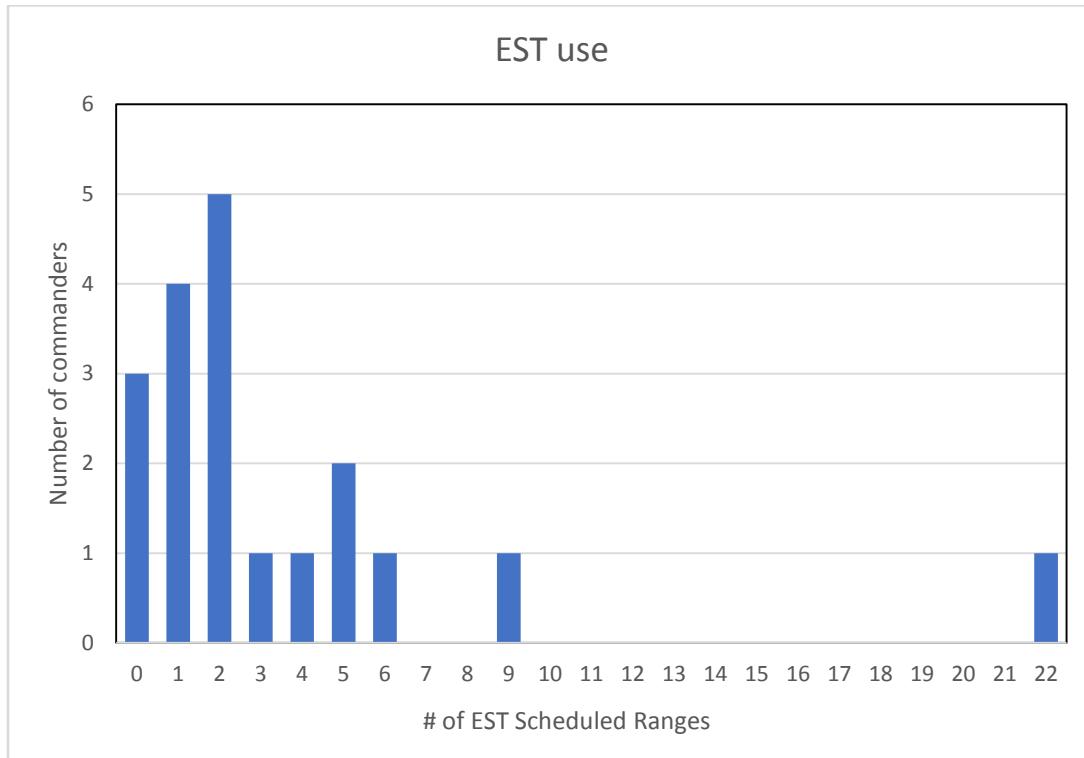
Figure 4.   EST Use

Source: Created by author.

Battery commanders identified PMI as the primary reason to use the EST. Of those, only three (16 percent) were influenced by the battalion or brigade commander. This provides insight that roughly 85 percent of the battalion level commanders in the chain of command do not emphasize the EST system. Of the respondents, there are some unique applications of the EST training opportunities.

First, one commander noted he used the EST as an actual qualification. This was the only commander to use the EST as a qualifying event. This commander stated he was authorized to use the EST as an actual record qualification. This goes against Army regulations as stated in FM 3-22.9 and DA PAM 350-38.

Additionally, a different commander used the EST range as a validating event for leaders. Those charged with running the live range also had to run the EST range. They presented the same information to the battalion leadership, and conducted the range as closely as possible to a live range with tower commands, risk mitigation measures, and movement on and off the EST range. The commander believed this was the best way to train leaders and soldiers for live ranges. Although there were a wide variety of reasons commanders used the EST, all but three commanders used the EST as PMI before a record qualification.

Based on results from survey questions 1 and 2, the research showed sixteen of nineteen commanders used the EST in their training plans. The primary purpose was PMI for live fire ranges. Later, research discussed instances where commanders used the EST for reasons other than PMI. In addition, commanders used the EST about three times during an average twenty-one month command period. This indicates PMI is the primary reason for EST use.

Secondary Question #2
Why Did Commanders Use the EST?

Secondary question 2 was answered through detailed analysis of survey questions 3, 4, and 9. Survey question 3 examined the focus of the EST training sessions: individual, crew, or judgement training. The nineteen commanders interviewed were asked how they used the EST to train soldiers: individual, crew, or judgment training. The sixteen commanders that use the EST stated they used it for PMI and individual training.

A closer look at the data revealed nine of nineteen commanders used the EST for two of its training capabilities, individual and either crew or judgement training. This is defined as moderate use. Of those nine, four used individual and crew training, while five used individual and judgement training. Only one commander of nineteen used the EST for all three training capabilities: individual, crew, and judgment training scenarios. This is defined as maximum use. The data in question 3 was broken down into four categories of commanders who used the EST by number of training capabilities. See figure 5 for the breakdown.
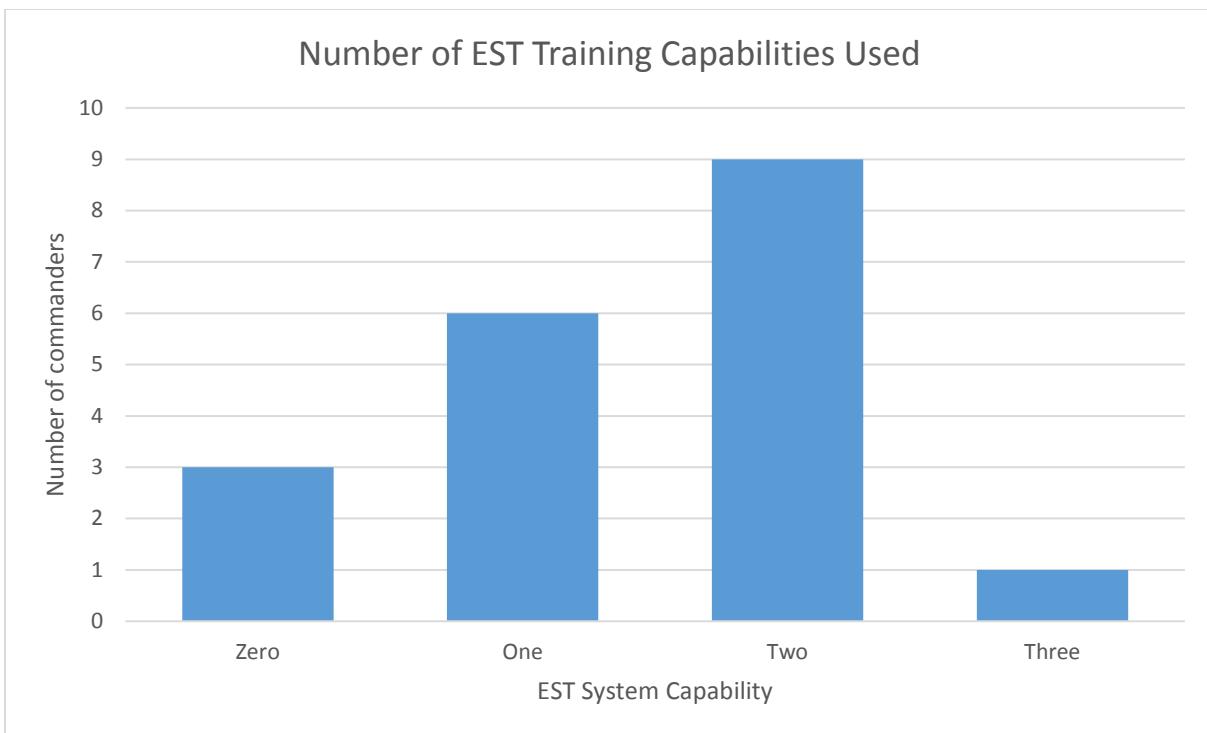
Figure 5.   Number of EST Training Capabilities Used

Source: Created by author.

The interesting takeaways were two unique opportunities revealed in the research. One of the officers commanded a Warrior Transition Unit (WTU). These soldiers presented a unique population. The WTU did not have any weapons on its MTOE for soldiers to shoot at the range. Leaders at the WTU set up EST ranges for soldiers preparing to return to units. This method was highlighted in research from the ASAARL. This research noted the EST could be used to help integrate wounded warriors back into the force.[37]

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[37] Heber Jones, Melody King, and Steven Gaydos, *A Novel Application of the Point and Aim Trace Feature of the Engagement Skills Trainer 2000* (Fort Rucker, AL: United States Army Aeromedical Research Laboratory, 2011), 3.

The second unique opportunity came from a commander who used the EST twenty-two times. On a few occasions, he integrated the simulation into the Comprehensive Soldier Family Fitness program, commonly referred to as CSF2. This program is committed to improving the physical and spiritual lives of soldiers, family members, and civilians.[38] Sports psychologists from CSF2 helped soldiers use visualization techniques to improve qualification scores. Although this was anecdotal with no supporting evidence, the commander felt that using a sports psychologist assisted in improvement of qualification rates. Overall, ten of nineteen (53 percent) of the commanders moderately used the EST.

Survey question 4 examined night and CBRN familiarization fires in the EST. CBRN and night familiarization fires were underutilized in the EST. The research showed only one of the sixteen commanders used the EST for both night and CBRN familiarization fires. This EST range was conducted prior to deployment as part of the unit's training progression. Eleven of the commanders responded that they did not use the EST for any familiarization fires. The two greatest reasons stated were lack of time and lack of command emphasis. Four of the commanders stated they used the EST for night familiarization fires, but not CBRN fires. Figure 6 shows the comparison of individual familiarizations fires.

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[38] Uniformed Services University, "Comprehensive Soldier and Family Fitness," Human Performance Resource Center, accessed 27 April 2017, http://hprc-online.org/total-force-fitness/total-force-fitness-programs.
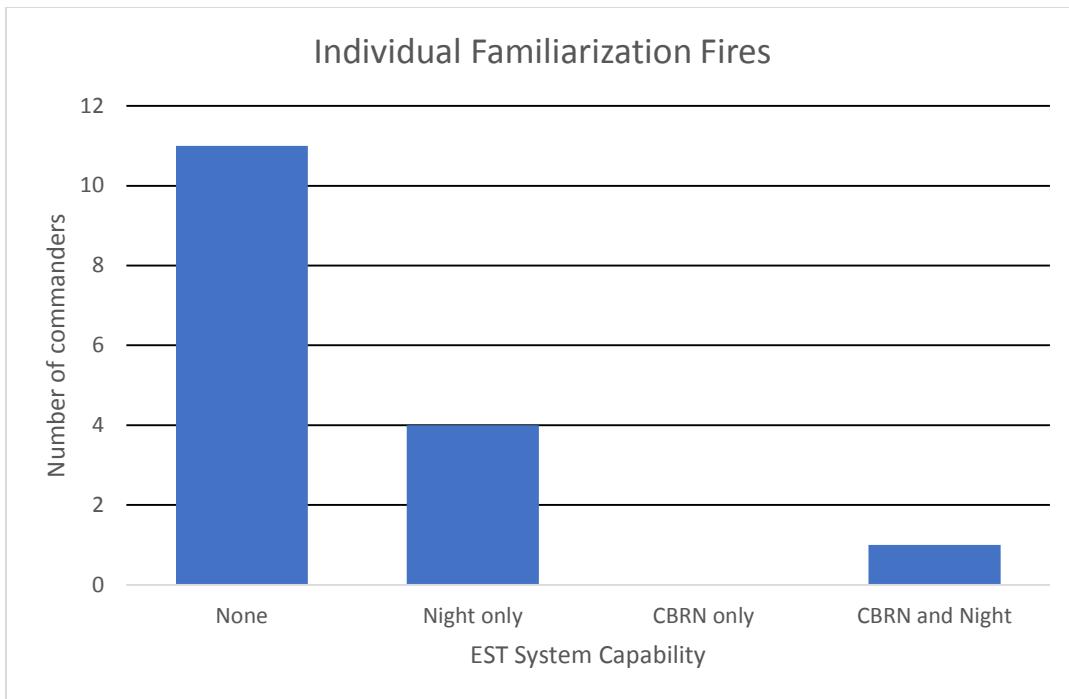
Figure 6.   Individual Familiarization Fires

Source: Created by author.

If commanders do not complete this task in the EST or complete the task on the
live fire range, then they are deficient in their training requirements and unit readiness.
However, if they conduct the training on a live fire range, this reduced the amount of
ammunition allocated for live fire qualification, since ammunition allocation is reduced
on installations with EST per STRAC guidance. The EST should be used to meet the
needs of CBRN in familiarization fires, because using live ammunition for the training
reduces their overall ability to train soldiers.

Survey question 9 examined where the EST is superior to live fire training.
Commanders across the study agreed that cost savings, time savings, and simulator
feedback made the EST superior to live training. Fourteen of the seventeen commanders

stated one of these three reasons is a contributing factor to EST's superiority. Some commanders also identified unique capabilities while conducting EST training.

Two commanders stated they were able to use this training to help develop NCOs during sergeant's time training. One commander used the EST training as a mock range. He directed the NCOs to try to replicate a live range as much as possible with range commands and actions that soldiers would see and hear on a live range. This facilitated two training objectives. First, it validated the leaders who were scheduled to run the live fire range. Second, it provided simulated live ranges to junior soldiers, who are not accustomed to regular live fire ranges. The soldiers were able to experience range commands and movements, which better prepared them for qualification day. The commander took a single EST training event, and turned it into a training event for not just soldiers on basic rifle marksmanship, but a training event for NCOs as well.

Through analysis of survey questions 3, 4, and 9, the researched revealed that commanders made limited use of EST training capabilities. Nine of the commanders used only two capabilities, individual and either crew or judgment training, and six commanders used only individual training. Eleven of the commanders conducted zero night or CBRN familiarization fires. Though commanders identified time saved, cost-benefits, and simulator feedback as EST benefits, the rates of EST utilization revealed commanders could have use the EST more.

Secondary Question #3
Will EST Use Improve Unit Capabilities?

Secondary question 3 was answered through detailed analysis of survey question 11. Survey question 11 examined whether commanders find the EST an effective tool to

train soldiers. The research revealed an overwhelming majority of the commanders believe the EST is an effective system to train soldiers. Fourteen of the nineteen commanders identified the EST as an effective trainer. The two primary reasons stated for EST effectiveness were the quality of training that soldiers receive while in the EST and the high number of repetitions those soldiers can fire the weapon. Commanders appreciated the fact that soldiers, while in the EST, can get individualized feedback from NCOs and instructors with accurate and immediate feedback from the system. The feedback is displayed on the simulators to highlight any issues with the four firing fundamentals.

Commanders also appreciated that soldiers can get many repetitions while in the simulator at no cost to the unit. Additional factors contributing to EST effectiveness are convenient training environments and locations, subject matter experts managing the simulator, and vignettes offered in the collective trainer or shoot/don't-shoot scenario based training events. Only two of the commanders believe that the EST is not an effective tool to train soldiers. They stated the EST was just another training event that needed to be conducted, and in one case noted negative psychological differences between a simulated and a live range. Overall, the overwhelming trend among commanders is that it is an effective tool to train their soldiers in which they can get high repetitions, individualized, detailed, and immediate feedback to improve their shooting capabilities.

Secondary Question #4
Why is the EST Not Used More?

Secondary question 4 was answered through a detailed analysis of survey

questions 8, 10, and 12. Survey question 8 examined whether commanders wanted more

training time in the EST. Of the sixteen commanders that used the EST, nine identified

that they did not want to use the EST any more than they had already done. Seven

commanders expressed the desire to use the EST more than they did while in command.

Of those who expressed the desire to use the EST more often, time limitations were most

frequently noted as the constraint. Specific examples that limited the EST were the

operation tempo being too high; could not balance all tasking's and complete scheduled

EST training. Additional comments note the EST was seen as a distraction to live fire

training or EST training was not worth the time compared to live fire ranges.

Nine commanders stated they did not want to use the EST more than they did

while they were in command. Reasons for not wanting to use the EST were because

simulators did not match environmental conditions; EST only needs to be conducted once

per year and soldiers get enough training during the EST; a focus is on live ranges, not

simulated ranges; and NCOs were able to identify weak soldiers prior to each live range.

The two biggest trends for commanders not wanting to use the EST were that one

training event per year is enough, and that they would rather have live ranges. For those

commanders that wanted to use the EST more often, time availability was the biggest

constraining factor that limited their availability to use the resource.

Survey question 10 examined how commanders found the EST deficient to live

fire. These indicators limit future or further use of EST training capabilities. Multiple

commanders gave reasons for the EST's deficiency. The three biggest EST deficiencies

were weapons malfunctions due to worn out equipment, lack of simulator realism, and psychological factors. Their greatest concerns with psychological impact from using the EST were based on safety issues when firing live rounds. They feared soldiers may treat a live weapons the same as a simulator. This indicated that commanders believed soldiers do not take gaming scenario events as seriously as a live fire event. Soldiers were more inclined to develop a sense of comfort and ease around the gaming system. However, once they went to the live range, through either internal factors or external stressors placed on them by NCOs, a psychological change occurred when they fired actual lead rounds downrange.

Two of the commanders interviewed identified that they would like to see the EST as a simulation that can link with other simulators like VBS3. Indications from the interviews showed a trend that commanders have a wide variety of opinions about EST deficiencies compared to the superiority of live fire ranges, with realism and psychological applications as the greatest limitations.

Survey question 12 examined how commanders would like to improve EST capabilities. Question 12 did not directly reveal why commanders did not use the EST more. However, any desired additional capability not in the EST may indirectly limit a commander's use of EST. Commanders described a wide variety of ways to improve the EST. The two most commonly cited improvements were availability to soldiers and maintenance issues.

Commanders cited they would like more available hours with more access, and the ability to use a portable or local system. Additionally, commanders stated that maintenance needed improvement, citing that jamming weapons and magazine sensitivity

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distracted from training events. Some additional improvements suggested by commanders included leader control of scenario-based training events to provide NCOs the ability to steer or direct the scenario based on those soldiers participating in the event, in the manner of a choose-your-own-adventure-book.

Additional capability improvements would be a three-screen system instead of a single screen; this helps develop reflexive fire capabilities in the COIN environment where the enemy may not always be in front of you, and soldiers need to be aware of battle buddies on the field. Finally, two commanders cited wireless or untethered weapons should be easily attainable with today's technology. Thirteen commanders provided recommendations to improve the EST, whereas three commanders identified no desire to change the engagement skills trainer.

<div align="center">

Primary Research Question
Can EST Use Be Improved?

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This research revealed the EST use could be improved. Commanders made limited use of the capabilities of the EST. Secondary research question 1 revealed sixteen of nineteen commanders used the EST. Of the sixteen commanders who used the EST, commanders used the EST an average of almost four times over a twenty-one month period. Twenty-one months were the average time of command for the nineteen commanders.

Secondary question 2 revealed commanders use only limited EST capabilities. All sixteen commanders used the EST for PMI. However, PMI was the primary reason for training. Ten of the nineteen commanders used two or more capabilities in the EST for individual, crew, or judgment training. Commanders did not schedule extra EST ranges

for crew training or judgment training. Rather, they conducted this training along with

PMI scheduled training events. Only one commander used all three of the EST's training

capabilities.

Fourteen of the nineteen commanders (74 percent) failed to use night and CBRN

familiarization fires. The effect of this carried consequences across the unit. If a

commander uses live ammunition to conduct familiarization fire, this reduces

ammunition available for live fire. However, if a commander does not conduct any of the

training, the unit remains untrained.

Secondary question 3 revealed the EST could improve unit capabilities. Fourteen

of the nineteen commanders identified the EST as an effective trainer. Commanders

identified two primary reasons for EST effectiveness, quality of training that soldiers get

while in the EST and the high number of repetitions those soldiers can fire the weapon.

Commanders liked the individualized feedback from NCOs and instructors with accurate

and immediate feedback from the simulator. Additionally, commanders appreciated the

repetitive training soldiers received in the simulator. Zero unit training dollars spent is an

added benefit for commanders. Finally, secondary question 4 revealed why commanders

did not use the EST more. The response common to almost every commander was time

limitations, from tasking's, competing events, and operation tempo.

Conclusion

The majority of commanders surveyed use the EST as a battery-level training

event. Only one commander applied maximum use of the EST by using all three of its

training capabilities. Nine commanders made moderate use of the EST using two of its

capabilities. Nine commanders made marginal use of the EST by using one or none of the

systems capabilities. Therefore, this study concludes that commanders make moderate use of the EST in their training programs.

In this study, the most common system used was individual training since PMI was conducted and was the focus of every commander. The data revealed that, across the study, commanders use the EST primarily as PMI preceding a live range about once every six months. This remains consistent with most units for qualification. Commanders consistently stated that PMI training was the primary use for the EST as they prepared to conduct a live fire. Very little use of the EST was dedicated to night fires and CBRN fires. Commanders agreed, throughout the study, the benefits of the EST are tangible and substantial with cost-benefits, high volume training, and detailed feedback as being the simulator's greatest assets. There is a disconnect between commanders' beliefs and their actions, as only one commander applied maximum use of the EST by using all three training capabilities. Chapter 5 addresses recommendations to close the gap between knowledge and behavior.

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

Introduction

The purpose of this study was to improve the EST use to better assist the commander to train soldiers. Additional benefits of the research identified how commanders use the EST to train soldiers. Furthermore, a noticeable gap in EST capability and use provides an opportunity to make recommendations to close the gap. This chapter provides a summary and interpretation of the information provided from interviews with artillery officers. The overview in this chapter highlights the results of the interview showing how commanders used the EST as part of their training plans. Next, the chapter discusses what the results mean about training plans, and how EST is utilized at the battery level. Furthermore, the chapter highlights unexpected findings during the study. Finally, the chapter makes recommendations for practice and future research.

Summary of Study

Results of this study indicated that commanders made moderate use of the EST. This study defined moderate use as greater than 50 percent of commanders used two or more of the EST training capabilities. This study identified ten of the sixteen commanders used more than one training capability of the EST. Every commander used the EST for one primary purpose, to prepare for range qualification. This conclusion is supported by the results of secondary questions 1 through 4.

First, the study revealed sixteen of nineteen commanders used the EST. Of the sixteen commanders who used the EST, the data showed that commanders used the EST and average of almost four times over a twenty-one month period. Second, the research revealed commanders applied marginal use of EST training capabilities. All sixteen commanders used the EST for PMI as their primary reason for training. Commanders did not schedule extra EST ranges for crew training or judgment training. However, ten of the commanders conducted additional training while in the EST. The research showed that these training events were not scheduled training events, but opportunity training. Furthermore, only one of those ten commanders used all three training capabilities in the EST. The research data showed fourteen of the nineteen commanders did not use night and CBRN familiarization fires in the EST. Third, commanders believe the EST could improve unit capabilities. Fourteen of the nineteen commanders identified the EST as an effective trainer. Finally, commanders identified time limitations as the greatest constraint to using the EST.

Two implications of the study revealed commanders waste time by not using the EST system available to them or they waste training resources by using live ammunition conducting tasks that should be performed in the EST. Also, and the least favorable implication, commanders did not conduct required training. These outcomes from the study highlight commanders do not take full training opportunities to use all of the EST capabilities.

The study revealed an unexpected outcome based on past knowledge and research. The first unexpected outcome is most commanders used the EST more than expected. Sixteen of the nineteen commanders used the EST in their training program for

one reason or another. Based on research, the EST was used more than anticipated. The researcher had little experience using the EST. The lack of understanding was believed to be wider spread or Army-wide. Though most commanders in this study used the EST, they used it for one reason, PMI training. Ten of the sixteen commanders used the EST for PMI and one additional capability during opportunity training. The research revealed that more commanders use the EST than expected.

<p style="text-align:center">Recommendations</p>

The first recommendation is to require using the EST as part of marksmanship qualification. Institutionalized change is the best way to improve EST use. The cliché--if training is not checked, training is not conducted--might be more common than people realize. Policy changes make real changes in the Army. FM 3-22.9 must change to make EST PMI a mandatory part of marksmanship training. The policy change would force the commanders to use the EST more than the results of this study. The three commanders that chose not to use the EST would find themselves required by Army regulation to use EST in their training program. DTMS is the tool used to verify EST PMI and pre-qualification training was completed. Then, commanders have the means to verify training progress from EST to live fire.

Policy changes can go one step further. A second policy change would allow commanders to use the EST as a sustainment qualification. Only soldiers on their second qualification in the unit would use the EST as record qualification, Hagman's study showed the EST as a reliable predictor of live fire scores.[39] Newly arrived soldiers to unit

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[39] Hagman, 216.

must be assigned and qualify with their weapon. However, once soldiers have assigned

weapons with sights adjust for the individual, the soldiers can conduct their second

annual qualification in the EST. This cycle would repeat yearly so soldiers would conduct

one live fire and one EST qualification. Policy changes would force all commanders to

use the EST in their annual training plan and the Army would save money on

ammunition. Policy change is the first recommendation and only way to force

commanders to use the EST. New policy changes would drive up EST use and place

greater stress on the facilities and trainers, which leads to the second recommendation.

The second recommendation is to increase the number of EST systems and

maintainers. In this study, commanders stated limited facility hours restricted access to

the EST. An additional concern to commanders was the training required to use the

facility. Commanders did not like to lose soldiers for the four-day training required to run

the EST.[40] If it is difficult or time intensive to get qualified trainers to operate the EST,

this limits commander's ability to reschedule training events. Civilians are available to

train soldiers to operate and lead company-scheduled events, but they are not there to run

soldiers through the training. Therefore, an increase in systems and maintainers is

required. The increased maintainers enable commanders to conduct more training, and do

not require time-intensive blocks of instruction prior to use. The second recommendation,

to increase EST systems and maintainers, enables commanders to meet the new demand

placed on them by the policy changes in the first recommendation. The increased EST

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[40] John Bess, interviewed by Ryan Debeltz, Fort Riley, KS, March 14, 2017.

use forces commanders to have a better understanding of the EST, which leads to the last recommendation.

The final recommendation is to implement digital simulation training in units. Digital Master Gunner (DMG) should conduct leadership professional development (LPD) in their units. Selected leaders from units are trained at Fort Leavenworth's DMG course. The leaders are usually experienced E-6s and E-7s or senior lieutenants. These trainers are capable to integrate mission command systems and digital gunnery systems into unit training plans. The DMG should make a deliberate effort to develop and guide company level commanders on the systems available for training. The best way to get all leadership to understand the system, capabilities, and added value is to conduct a digital systems LPD lesson in which the battalion training staff and company-level leaders are the targeted audience. This provides the users and trainers insight to EST capabilities. In addition, DMG should encourage commanders to direct the EST training down to the platoon level.

EST training conducted at the platoon level provides greater training opportunities to soldiers. In this study, battery-level training events with PMI were observed as the focus to prepare for live fire ranges. This provided soldiers little time to conduct anything other than PMI and range qualification training. However, training directed by the platoon leaders and platoon sergeants, allows more time to work with soldiers. It is easier to do more training at the platoon level, like judgement-based scenario training, night, and CBRN familiarization fires, or crew served weapons training. The commander who manages all training at the battery level will likely struggle to get personnel through the PMI and qualification in the EST. However, the commander that delegates the training to

the platoon level, and follows through with platoon leadership to ensure the training is conducted, enables soldiers to get better training opportunities. Platoon-level training allows juniors leaders to lead the training and develops soldiers preparing to become NCOs. There are numerous benefits to platoon level training in the EST. Most significantly, soldiers could get the opportunity to get personal and quality instruction on a greater number of training events, such as individual, crew served, and judgement training. The final recommendation is to conduct DMG LPDs to enable commanders to better understand and incorporate all EST capabilities into their unit training plans.

The completed research raised new questions. The results of the study showed commanders used the EST marginally. Commanders typically use only one training capability of the EST, to conduct PMI and prequalify with an M-4/M-16 before a live fire range. Sometimes commanders conducted unplanned, crew, and judgment training. If artillery commanders only used the EST to a third of its capability, how does the rest of the Army use the EST? Is there a difference in the combat arms versus combat support branches? A greater population sample must be researched to determine EST use across the Army. Thus, wider research is needed to see how the EST is used across all Army branches. A wider sample population gives insight to any particular branch uses the EST to a greater capacity, like crew served weapons qualifications or leadership development in the scenario driven events. If the Army as a whole conducts limited training in the EST, further research should look at potential modification to the system.

A second question, which requires further investigation, is how the EST impacts readiness ratings and Objective-T ratings? If commanders are not conducting EST night and CBRN familiarization fires, what is the impact to the unit's operational readiness?

DTMS tracks completed training and highlights the units' operational readiness. As the Army starts using Objective-T ratings, which takes all training into the readiness rating, not conducting night and CBRN familiarization fires is sure to impact a unit's rating. This information is visible to all levels above the company commander's chain of command. Further research is required to understand the EST impact on readiness and its use across the Army.

<div align="center">Conclusion</div>

The purpose of this study was to improve EST use in a commander's unit training program. To better understand how commanders used the EST, the research had to answer the primary research question, can Engagement Skills Trainer use be improved? The research interviewed post-command captains and majors to answer four secondary questions. The secondary questions were how often was the EST used? Why did the commander use the EST? Will the EST improve unit capabilities? Why the EST was not used more?

The research completed twenty interviews of post command field artillery commanders. They were asked a series of administrative and EST related training questions. In conclusion, the study determined that commanders moderately used the EST in their unit training programs. Moderate is defined as greater than 50 percent of commanders used two or more of the EST training capabilities. Specifically, this study revealed six commanders used only one EST capability, individual training. Nine commanders use two of the EST training capabilities and only one commander used all three training capabilities: individual, crew, and judgment training.

Furthermore, the secondary research questions revealed commanders used the EST primarily for PMI prior to ranges. The data indicated consistent one-for-one use between PMI and live range training. Commanders use the EST an average of almost four times in a twenty-one month period. Twenty-one months was the average length of command time. Commanders agreed the EST is a useful tool to train soldiers. The EST gave immediate and detailed feedback, which soldiers could use to correct deficiencies in the four firing fundamentals. Additionally, commanders appreciated the high repetitions soldiers received, aiding in soldier comfort and quality of training. Finally, time constraints from higher headquarters and mandatory training were the greatest limitations to EST use. The study concluded that EST use could be improved.

The following recommendations were made to improve EST use. First, policy change must require EST is integrated into the qualification process. The EST must be conducted as PMI and pre-qualification before live fire. Additionally, EST should be allowed as a record test. This is only allowed after a soldier has already qualified with an assigned weapon. Therefore, the EST record qualification is a sustainment training qualification. Second, the Army must increase EST systems and maintainers. This enables commanders the time, facilities, and support staff to accommodate the increased demands. Finally, the unit's DMG must conduct LPDs in their units arming commanders with the knowledge and capabilities of the EST and other digital systems. These recommendations will increase EST use.

APPENDIX A

INFORMED CONSENT FORM FOR QUALITATIVE STUDY

Qualitative Study Related to EST and
Commander's Training Program

The research method for this thesis is a qualitative literature review and

questionnaire distributed to human participants.

Purpose

You are invited to participate in a research study that is part of thesis requirements

at the Command and General Staff College at Fort Leavenworth, Kansas. The purpose

the study is to develop an understanding of how the Engagement Skills Trainer (EST)

impacts a company commander's training program. I, as the proprietor of questionnaire,

will administer the survey and maintain all records. Once the data is collected, a

qualitative analysis will be conducted to determine perceptions and common beliefs

about the efficacy of EST as it relates to unit training. There is no deception in this study.

Participation Requirements

I am asking you to participate in a qualitative questionnaire. The questionnaire

will consist of four administrative questions followed by twelve survey questions

concerning the use and beliefs of the EST. The first four questions of the survey will

address general background and experience as a company grade officer. The

questionnaire will not comprise of questions that will present participants with any

potential violations of the Uniformed Code of Military Justice or criminal law nor will

any classified material be contained in the survey.

Potential Risks/Discomfort

There are no known risks in this study and none of the information contained in this questionnaire is personally sensitive. Additionally, no PII will be included in the survey. You may withdraw at any time and not answer any questions you feel uncomfortable answering.

Potential Benefit

There are no direct benefits to you to and I offer no compensation or incentives for your participation in this questionnaire. The results of this questionnaire will assist the Researcher by shedding light on identified gaps with regards to how Army commanders utilize the EST. By doing so, greater effort can be directed towards filling those gaps through further research. Documents with your name such as this form will never be stored together with your data. Additionally, I will not have the means and therefore not be able to equate your answers on the questionnaire to this consent form.

Anonymity/Confidentiality

All data obtained about you will be for the purposes of conducting the questionnaire and will be considered privileged. You will not be identified in any presentation of the results. Complete confidentiality cannot be promised to subjects. All data collected in this study is confidential and is coded so that your name is not associated with them. The coded data will be made available to me as I conduct the analysis associated with this study. This form will be stored by the Combined Arms Center – Education Human Protections Administrator (CAC-E HPA) for three years. The

Army Human Subjects Protection Office or a designated Department of Defense (DoD)

representative may review this form to ensure compliance with DoD regulations.

<u>Right to Withdraw</u>

Participation in this survey is voluntary. You have the right to cease completing

the questionnaire at any time without penalty. You have the right to decide to not answer

questions when filling out the questionnaire if you do not feel comfortable answering

them or stop all together. If you withdraw from the survey, I will not use any data

collected from you and you will suffer no penalties whatsoever from your withdrawal. I

will be happy to answer any question that may arise about this study.

<u>Contacts for Additional Assistance</u>

Please direct your questions or comments about this interview to MAJ Ryan

Debeltz 254-319-8737. If you have any questions or concerns about the conduct of this

questionnaire, please contact the Command and General Staff College 913-684-2741, or

the CAC-EHPA, Dr. Bobbie Murray 913-684-7311.

Signatures

I have read the above description of qualitative questionnaire regarding EST

impact to unit training and understand the conditions of my participation.

My signature indicates that I agree to participate in the study.

Participants Printed Name: _____
Participants Signature: _____

Researchers name: MAJ Ryan J. Debeltz
Researcher's Signature: _____
Date:

APPENDIX B

COMPOSITE INTERVIEW RESPONSES

Responses are randomized to maintain anonymity.

Administrative Questions

A. When and how long were you in command? (year / #months)

   a. DEC 2013 - FEB 2015, 14 Months
   b. 2010-1012, 24 months; 2013 - 15, ~~15 months (WTU)~~
   c. 2007 - 2008 17 months; 2011-2013 ~~15 months (TRADOC)~~
   d. 2013-2014 ~~19 months (TRADOC)~~
   e. 2011-2013, 19 months
   f. 2013-2014, 22 months
   g. MAY 2009 - OCT 2010, 17 months; OCT 2010 - MAR 2012, 17 months
   h. FEB 2012 - JUN 2013, 16 months
   i. SEP 2012 - FEB 2014, 16 months
   j. FEB 2013 - AUG 2014, 18 Months
   k. DEC 2012 - MAY 2014, 17 months
   l. MAY 2013 - MAR 2016, 33 Months
   m. 2010 - 2012, 24 months
   n. FEB 2013 - DEC 2013, 11 months; JAN 2014 to DEC 2014, 11 months
   o. MAR 2013 - JUL 2014, 16 months
   p. APR 2012 - NOV 2013, 19 months
   q. MAR 2010 - MAY 2011, 14 months; MAY 2011 - JAN 2012, 12 months
   r. MAY 2011 - AUG 2012, 15 months
   s. JUN 2010 - APR 2012, 22 months
   t. JUN 2013 - MAR 2015, 22 months

B. Type of unit commanded? (Artillery, combat arms, or other)

    a. Artillery
    b. Artillery, WTU
    c. Artillery, TRADOC Basic Training unit
    d. TRADOC Basic Training unit
    e. Artillery
    f. Infantry
    g. Artillery and Cavalry Squadron
    h. Artillery
    i. Artillery
    j. Cavalry Squadron
    k. Artillery
    l. Artillery
    m. Artillery, Infantry
    n. Artillery
    o. Artillery
    p. Artillery, Artillery
    q. Artillery, Artillery
    r. Artillery
    s. Aviation
    t. Artillery, Artillery

C. Did you spend any time as an AS3 or S3? How many months?

   a. No
   b. 24 months
   c. No
   d. 5 months
   e. No
   f. 24 months
   g. No
   h. 12 months
   i. No
   j. 6 months
   k. No
   l. 5 Months
   m. No
   n. No
   o. 12 months
   p. No
   q. 14 months
   r. No
   s. No
   t. 21 months

D. Were you deployed while in command?

a. Yes, 8 months
b. Yes, 3 months
c. Yes, 4 months, at the end of the command time, Deployed the unit and then came home
d. Yes for 12 months. It split the commands.
e. 6 months for each command: 6 months on the front and back side of the deployment
f. year deployment in the first command
g. 8 months
h. Yes, 9 months in Kuwait
i. Yes, 12 months during
j. No
k. No
l. No
m. No
n. No
o. No
p. No
q. No
r. No
s. No
t. No

Interview Questions

1. Did your unit use the EST?

If your answer is "No," please, provide a description as to why and do not answer any of the following questions. Thank you for your time and consideration.

If your answer is "YES," please, answer the following questions.

   a. Yes
   b. Yes, in both commands
   c. Yes, in both command
   d. Yes,
   e. Yes
   f. Yes
   g. Yes
   h. Yes, recommended by the chain of command
   i. Yes
   j. Yes
   k. Yes
   l. Yes
   m. Yes
   n. Yes
   o. Yes
   p. Yes.
   q. Yes, it was required as part of basic training program
   r. No, The focus on basic rifle marksmanship. EST was available. Just didn't use. Boiled down to time. More time spend on the live range vs simulated range.
   s. No, I didn't like the lack of realism. It builds a self confidence in a gaming environment, but it is not the same as shooting live range. I understand there is a cost benefit but I did not want to train on simulated ranges.
   t. No, while deployed the EST was not available. Once back home we went into reset and weapons were gaged so they were not available. During training phase, they had enough ammo and resources allocated to shoot all live. Operational tempo of staff and personnel limited training day opportunities so the focus remained on live training rather than simulations

2. How often and why was EST training provided?

   a. During deployment, fundamentals and maintain skills, team building events.
   b. Two times, BDE Commander focused on LVCI due to Army Chief of Staff General Odierno's guidance. Both times the EST was use as training prior to BRM.
   c. First command: used 2 time after deployment. IT was used more as an alternative when range space was not available. In WTU it was used as a means to get Soldiers training when not assigned organic weapons.
   d. One time. As part of BRM in pre-range week training. They had personnel that needed to be trained prior to EST use.
   e. Required, 7 EST ranges per 9-week cycle. 56 times
   f. Only one time: TRADOC, EST was use two times per cycle = 9 weeks. Sometimes it was used during drought times and during a burn ban.
   g. Cannon- three times, HHQ 2 times
   h. One per year, per AR 350-1, individual training progression.
   i. Two times in 34 months of command. Once before and Once after my deployments
   j. 2 times per year, 3 total during command.
   k. EST was used a total of 5 times, it was counted as a qualification. Used every 2 months. Then it was not used as a qualification, then it went back to use as a qualification: 6 months usable, 6 months not usable, 4 last 4 month it was used:
   l. 1 training exercise, conserved ammo and convenience, use of the system was highly recommended by chain of command
   m. Once a quarter, BRM training progression
   n. Kuwait, we used the EST once per month, 7 times in nine months. CONUS once before the deployment, once after the deployment. Total of nine times. Pre / post, fundamentals training. Train up for the live range. Use it twice for PMI
   o. Only once, used prior to a live range. Part of Crawl walk run, Walk. Not directed by commander
   p. Once per month. BDE Commander was a month metric
   q. before every range, do before we used of live rounds. Training event one time every six months.
   r. NA
   s. NA
   t. NA

3. What was the focus of EST training sessions, individual, crew, or judgement training?

    a. Individual and crew weapons training. The focus was for qualification on individual weapon (M-4 BRM), add familiarization with crew served weapons.
    b. Individual only
    c. Small arms qualification, Zero, practice in the EST, transition to the range and qualify as part of the small arms program. No judgement or crew served
    d. Used for individual BRM training added some M249 training. Judgement shoot was used once with available time.
    e. Used primarily as individual, shoot-don't-shoot used with WTU was more individual skill development. No crew training.
    f. Both FORCOM and Basic Training units used individual, TRADOC used judgements scenarios weapons.
    g. Mostly individual training for ranges, some advanced with one shoot-don't-shoot session.
    h. Meeting training requirements for BRM - individual, also used the shoot don't shoot scenario training.
    i. Individual, BRM. Used it during the Rear deployment as well. Integrated Comprehensive soldier fitness and used with sports psychologist. Use visualization to help with Qualification. Feels like it helped. No Crew served, also used in Shoot-don't-shoot when time was available.
    j. Individual training to improve BRM
    k. Individual added Crew served (240B)
    l. Individual, zero and qualification round
    m. Induvial only
    n. PME for BRM on M-4 individual weapons, third time added crew served weapons with PMI training
    o. Individual only to prepare for ranges
    p. Individual, 2 of the times we added the scenario based training
    q. Individual training focus, added some crew served judgment training with available time
    r. NA
    s. NA
    t. NA

4. Did your unit conduct night and CBRN familiarization fires in the EST? If not, why?

    a. Night yes but not CBRN. Both FORSCOM and BT units before BRM, and one time before ARM and scenario training.

    b. No, not enough time to conduct the additional training due to other training conflicts.

    c. No due to time constraints and not a priority.

    d. No, Not a focused for training event and time allocated.

    e. No, CBRN and Night fire not required at basic training

    f. Yes, both night and CBRN before and during the deployment

    g. Night yes, BCRN no, not a high pressing need for NBC, not compelled to do since it was not tracked or on the commander's radar. Night chose to do it as a rehearsal for the night fires. Shoot in low illumination missions

    h. No, availability of facility- it was too busy at the EST center.

    i. No, CBRN and night fires familiarization was conducted on a live range.

    j. Night yes, CBRN no. Time constraints.

    k. No, not a unit focus. Time constraints limited use

    l. No, not enough time and low priority

    m. No, Time allocation, not the commander's focus. Limited time due to training constraints.

    n. Night yes, CBRN, not tracked to BDE CDR so not important

    o. No, Too many additional time constraints. My focus was on getting units qualified, not simulators

    p. No, not a focus, never shot in a gas mask

    q. No, no interest. Not required for qualification.

    r. NA

    s. NA

    t. NA

5. How often was live training provided?

   a. 2 times per year, 3 total
   b. 4 times per year. Or once per quarter.
   c. 2 times after the deployment, WTU-individualized as soldiers were ready to fire the weapon
   d. 4 times or two times per cycle year in FORSCOM unit
   e. 9 live fire ranges in each 9-week cycle. Once per week.
   f. 2 times per year. As required for live qualification
   g. M-240B 1 time, M-4 Weapons qualification 1 time
   h. Maintain the 6-month qualification, one time before the deployment.
   i. Personal weapon live range was offered 4 times before the deployment. Crew served only offered one time during other training events.
   j. 1 time during command time. One EST for live fire training exercise.
   k. 1 time per month. 15-16 times live while in command.
   l. 2 times. Once per each qualification per regulation
   m. 2 training iterations prior to deployment (garrison, NTC) and then deployed.
   n. 1 time per month, this included crew M4 and 9mm on different ranges on different months. This was directed from the BDE commander.
   o. 1 time per six months. As rear detachment brigade, they were lowest priority on ranges. They were able to get to the EST to help.
   p. Once every six months keep up with standards. That's all.
   q. During the deployment 4 times = quarterly; in garrison, bi-annually.
   r. NA
   s. NA
   t. NA

6. What were the first time go rates for live fires?

    a. Best guess is 80%. It was tracked but does not recall the data. But they did stay in the EST unit they qualified.

    b. 60%, I felt the EST had a positive impact on qualification. Specifically compared to other CAV troops in the squadron

    c. I do not know

    d. Estimated at 20% for the first few cycles in command. About an 80% for the final cycles in command.

    e. Not noticeable? Do not know

    f. About 85%.

    g. Over 75% first time goes, out of 475 pax

    h. Unsure of rate but I believe there was no difference between soldiers who used the EST and those that did not use the EST

    i. First time go rates were 30%, at the end of command or the deployment, 90% both live fire ranges and EST attributed to the improved live fire scores.

    j. 75%

    k. 90% to start, dropped down to 60% tops, rates dropped due to personnel changes. Younger soldiers with poor understanding coming out of Basic training and a large gap in AIT time with no weapons handling experience. This could have been alleviated with the use of the EST.

    l. 60% remained the same while in command.

    m. No substantial difference from first time to second time. Unsure on the rates.

    n. EST May have influenced the first time go rates. About 90% Positive benefits

    o. 70%, by the end of command believed to be 85-90% first time go rates.

    p. Around 90 percent. They shot a lot.

    q. 70% then to 80% at the end of command

    r. NA

    s. NA

    t. NA

7. Was there ammunition left over and what was done with excess ammunition?

   a. Shot all ammunition. Send soldiers through again to retrain, also shot reflexive fires. Walk and shoot at 50 meter targets.
   b. Excess was turned in to ammunition point or was turned over to the next battery
   c. Turned full boxes in or opened boxes, shot ranges for weak shooters, Stress shoots.
   d. Used to put soldiers back through live fires due to low qualification rates. Also, did night live fires.
   e. Yes, improved weak shooters, no advanced marksmanship was offered. Showed a pattern of no advantage gained with EST use, people who shoot weak in EST are still poor performers with little improvements transferred onto the range.
   f. Yes, turned it back in. Limited ammo across the BDE so all extra ammo need to be turned back in for the SQDN
   g. Requalified weak shooters. A separate range was conducted for ARM
   h. Yes, worked on re-qualification, very little ARM
   i. Yes, unit ran the range for the week for the BN. Excess was turned in daily. Any excess during the last day was shot. Open ammo familiarization fires with 3 round bursts.
   j. Yes, because maximize fire. Reflexive fire techniques. Advanced shoot techniques with certain soldiers. Other soldiers that did not qualified well were recycled.
   k. Yes, reshoot weak, or unqualified soldiers. Otherwise allowed soldiers more trigger time. No advanced rifle training
   l. Used to train weak shooters or unqualified persons. ARM was a separate range
   m. Yes. Advanced RM and magazine drills, standing, Ammo requested to assist with ARM and getting comfortable with their weapons
   n. Continued BRM qualification for soldiers not already qualified. Unopened ammo was turned in.
   o. Yes; Re-qualify people. During the deployment, some advance rifle marksmanship was performed with remaining ammo. Following deployment excess ammo was used for retraining with new personnel who did not perform as well
   p. Yes, All ammunition was turned back in, open and unopened.
   q. Yes, ammunition was used for advanced marksmanship training opportunity
   r. NA
   s. NA
   t. NA

8. Did you want to spend more unit training time on the EST? If yes, what prevented you from spending more time?

   a. Home station yes, system was not easily available due to unit training requirements and system availability, EST is hard to get access to the system unless you scheduled 6 months in advance. However, that fare out it is easy to see the EST as a low priority so it is changed or canceled, then they alternate dates are unavailable.

   b. It was helpful, one for one training event is good. As HHT a staff rifle marksmanship is not really the focus. So, the EST was limited to one time.

   c. Yes, but other unit training events like 350-1 training last minute tasking, staff HHB functions were a greater priority

   d. No, it was adequate and the soldiers got a lot of reps.

   e. If yes, what prevented you from spending more time? One per year is enough

   f. When the EST was used, it was good. Operation tempo limited times to use the system. I would have like to use for sniper shooting and for more practice.

   g. No, it was good for what it is identified to do, NCO work assessment of junior soldiers

   h. No, I wanted more time on the live range

   i. Yes, balancing Red Cycle, 350-1, an Artillery skills testing

   j. Since it is a training tool and not a qualification system, it is a time distraction to actual training event. I am not sure the it really has an impact on qualification rates.

   k. No. Would have wanted more live ranges. It was good to augment.

   l. Absolutely, most commands do not register that the EST is as good as the range. During training brief, they want to hear live ranges not simulators. Also, to cycle teams on new weapons. Exposure. Safe capacity, low risk. Time was the biggest limitation. If available 1//3 2/3 live to simulations

   m. As a cannon battery commander, no

   n. No

   o. No, SM felt like it was not worth the time. 1. BRM is standard NCO training that sections leaders should be doing. EST does not match environmental conditions of live fire.

   p. Yes, competing priorities.

   q. Yes, if BT soldiers needed to qualify they would be sent back to the EST for training time. Trigger time is beneficial even on the EST. Tremendously beneficial

   r. NA

   s. NA

   t. NA

9. Where is EST superior to live training?

   a. Cheaper, environmental purposes, immediate feedback during training
   b. Cost-effective for the unit, flexible training system, leadership overhead. One NCO to run the system, free from environmental conditions.
   c. Enables soldiers to work on the four fundamentals. Easier in the EST than the live-fire range.
   d. Helps soldiers feel more comfortable when used in conjunction with PMI.
   e. Does not require as much prep time. Easier set up than a live fire. You get the shoot don't shoot and that is hard to replicate on the live fire ranges
   f. Night fire and CBRN with reduced risk, conserves ammunition cost. And sheer repetitions are better for the soldiers. Easy way to get individualized training and instructions. Small instructor to student ratio
   g. Cost, no budget money required. But live fire required to budget fort the ammunition
   h. Quicker reps for mass training, less intimidating to people who have never fired weapons before, smaller numbers in the simulator allow for more individualized coaching. The individual training was very effective for new recruits, gives more reps, noise, eases the nerves of new personnel on a weapons system. Gives a shooter more reps. Used all same commands as a live fore range.
   i. Time for individualized coaching, focus on skills and mitigates safety concerns, NCO training development. Cost-benefits. Time-efficient
   j. Unlimited ammunition available to you. If you need to requalify soldiers it is easy to retrain without range time or ammunition allocation.
   k. Gaming is more comfortable to younger soldiers. Immediate feedback is great for training. Easy and faster adaptation for breathing trigger squeeze etc. Senior folks not as beneficial-----interesting perspective
   l. Initial assessment from Junior NCOs before entering live fire ranges allow for identifying weak shooters.
   m. Great event to plan for Sergeant's time training, easy to reserve, always had slots available, less financial resources to the unit.
   n. Faster iterations, more practice. Easier to get scheduled. Cheaper for the unit
   o. Safety, money saving, more relaxed environment.
   p. EST is time efficient. Cost benefit because we did not have to pay for ammunitions or fuel. Free for the unit. Good familiarization tool. Must weigh the benefit against the cost. Time training on rifle vs Cannon system
   q. More repetitions, at low risk and low cost. Keep soldiers current in their capabilities
   r. NA
   s. NA
   t. NA

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10. Where is EST deficient to live training?

   a. Not a real weapon has an impact on psychology, no environmental factors present. No real bullets, has an impact with training standards
   b. Best to use as a training event for both leaders and soldiers, missing the realism. Not enough systems to access on a given installation. More systems by locations and down to the BDE level. Post with basic training units need more systems because FORSCOM units take a back seat and have limited availability. Weapons malfunctions was a faction during EST training
   c. Lacks reality, and environmental conditions, Going into EST with bad fundamental often lead to continued bad fundamental. This should be done at the NCO level.
   d. Can't exchange live for simulation. Degradation in crew drills. And fundamentals that you do not get due to psychological experience of simulated ranges
   e. Unsure, it worked how we wanted it to work
   f. No subsite for the real thing. Environmental conditions. The live ranges allow soldiers to training on planning and running ranges. The more the better. The feedback from live fire is more tangible.
   g. Sniper section could not utilize EST. Systems incapable
   h. Doesn't accurately represent real rifle actions, sound, recoil, ballistics, psychological but it is better than nothing.
   i. Environmental factors are not included. Noise, but may be able to add more sound effects.
   j. Weapons malfunctions occur more often in the EST. When it's a game setting, it is not taking seriously. Not using your actual weapon, reduced recoil and sound.
   k. Not linkable to other simulators like VBS3. 3-D linked to a command and control system
   l. I had to give an NCO up for six months, to run the range.
   m. Weapons malfunction often is a serious issue.
   n. The amount of attention EST get, not as many people make it a focus so it is harder to get the people to the EST, the focus for the command is live fire scores
   o. Not enough systems, would be great to have at each BDE / BN
   p. Environmental conditions not replicated with heat wind, not enough recoil on the weapons.
   q. Run by civilians, they have limited hours, and use. Day time but with dim lights does not accurately account for psychological aspects of night fires while fatigued.
   r. NA
   s. NA
   t. NA

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11. Did you find the EST effective to train soldiers?

    a. Yes, especially the non-combat arms and junior soldiers. Easier to train weak soldiers.
    b. Yes. Improved the basic marksmanship.
    c. No, it was another requirement that needed to be accommodated during training.
    d. Yes, but only to a certain degree because you do not get the psychological impacts of real rounds down ranges. EST helps to get all soldiers on a level playing field or at a minimum standard.
    e. Yes. Convenience, familiarization in a controlled environment, EST has SME on hand to assist.
    f. Yes, easy to get lots of repetitions.
    g. Yes, helps retrain soldiers that did not qualify. Also, helped new soldiers feel comfortable with firing a weapon.
    h. YES. Lots or repetitions, can provide coaching when needed. Individualized mentorship on the range.
    i. Yes, it meets requirements. If used in the right way effective as a Crawl walk run phase. Used in the walk phase.
    j. Can't exchange live for simulation. Degradation in crew drills. And fundamentals that you do not get due to psychological experience of simulated ranges.
    k. Yes
    l. Yes,
    m. Yes, most applicable to the junior soldiers. They do not have repetitions with live fire ranges. The EST gives they a greater foundation to build upon.
    n. Yes, shoot-don't-shoot was good. High repetitions, and initial assessment to get soldiers qualified.
    o. Minimal, it was good for crew-served and familiarization for systems that are not used as often by crews. However, for the personal weapons system it gets soldiers comfortable on the simulation but did not seem to transfer well to the live fire. Soldier's improvements on the EST were often absent at the live fire ranges. The Benefits were not transferable.
    p. Yes, it makes efficient. Trains a high number of soldiers in a short amount of time.
    q. Yes, Vignettes in the shoot do shoot are great.
    r. NA
    s. NA
    t. NA

12. How would you like to improve the EST system capability?

   a. Better replicate live conditions: sight, sound, taste, feel, temperature. The more real the better. Understands cost savings but does not substitute live fires
   b. Getting trainers qualified to a task for people with longevity. Make user friendly and simple like the iPhone. The system takes too long to set up once you arrive on site. Repeated with every unit or squad enter the simulator.
   c. Optics used on rifles used in combat, ACOGs etc…,
   d. Linkable to other simulators. VBS3. 3-D linked to a command and control system
   e. Operating system in not user friendly. Delays in system makes it hard for soldiers to cycle through. Required too much FSR help. There are a lot of software glitches.
   f. Not sure
   g. It should be used more. If people understood the system and the capabilities. It was even used at ROTC. The university had their own system.
   h. No change
   i. Wireless system to the weapons
   j. Ties into VBS3, or another system. Mobile, expandable to systems, and durable. Untethered/wireless capability. Mobile training within unit down to the BN level.
   k. No changes
   l. More systems available at lower unit levels. Allows to train one section at a time. Portable system would be great for BDE and BN Units. Potential to be good. But it is not a replacement for live-fires.
   m. Weapons systems that are not connected by wire. Reduced sensitivity to magazine fires from bumping the floor. Certain there could be better graphics.
   n. Sensitivity. The magazine to too sensitive
   o. 1. Requires too long to zero weapons every time. Takes 10 minutes per iteration. 2. Judgement training should have operator input like a choose your own adventure book.
   p. No change: More available hours though. Maintenance needs to improve with the system. Sensitivity and Jamming of weapons.
   q. Add sniper capability, A larger capacity for throughput. 12 per lane minimums. Make the system a 3-wall movement trainer capable of contact on different sides.
   r. NA
   s. NA
   t. NA

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